ENGINEERING NEWS-RECORD

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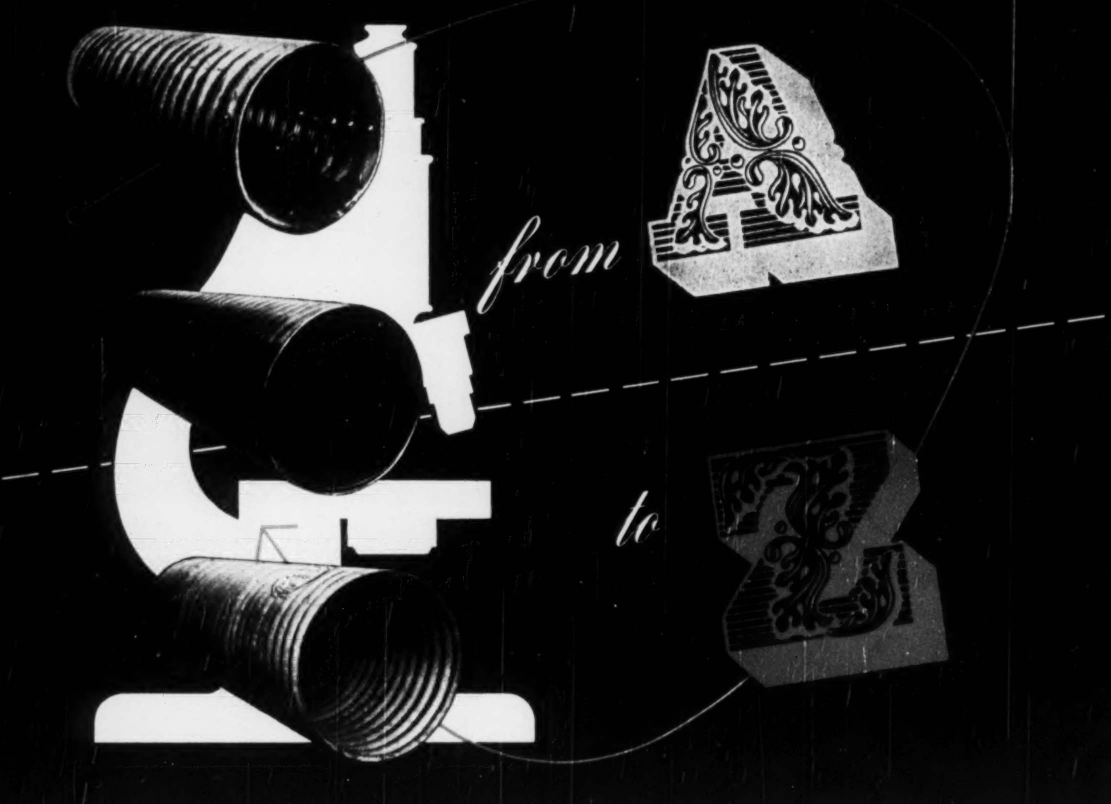


They covered corrosion from A to Z

"A" for Asbestos . . . "Z" for Zinc. It means there is an Armco Product to meet varying requirements of durability and service life. You get exactly what you need—save money in the bargain.

Armco engineers reasoned that economical drainage meant having the right product for specific jobs. Plain Galvanized Corrugated Metal Pipe was ideal for normal conditions. Then they developed PAVED-INVERT Pipe to combat erosion. A full bituminous coating gave further protection against corrosion. The ultimate in durability was achieved with Armco ASBESTOS-BONDED Pipe. Millions of asbestos fibers embedded in the zinc coating and thoroughly impregnated with a special saturant and seal coat provide great resistance to acid, alkaline and saline conditions. Individually or in any desired combination these products are the efficient, economical answer to almost every drainage service need.

Creating better products to meet specific needs has been the objective at Armco for more than 40 years. A few examples are HEL-COR Perforated Pipe, STEELOX Buildings, FLEX-BEAM Guardrail, PIPE-ARCH and sturdy, MULTI-PLATE Bridges.

Today you can bring your drainage and construction problems to Armco with full assurance you will receive all the benefits of long experience, extensive research facilities, and a real interest in helping you solve your most difficult problems.

Armco has a complete range of engineered products and convenient, authoritative data to help you. If your problem is difficult or unusual why not talk it over with us?

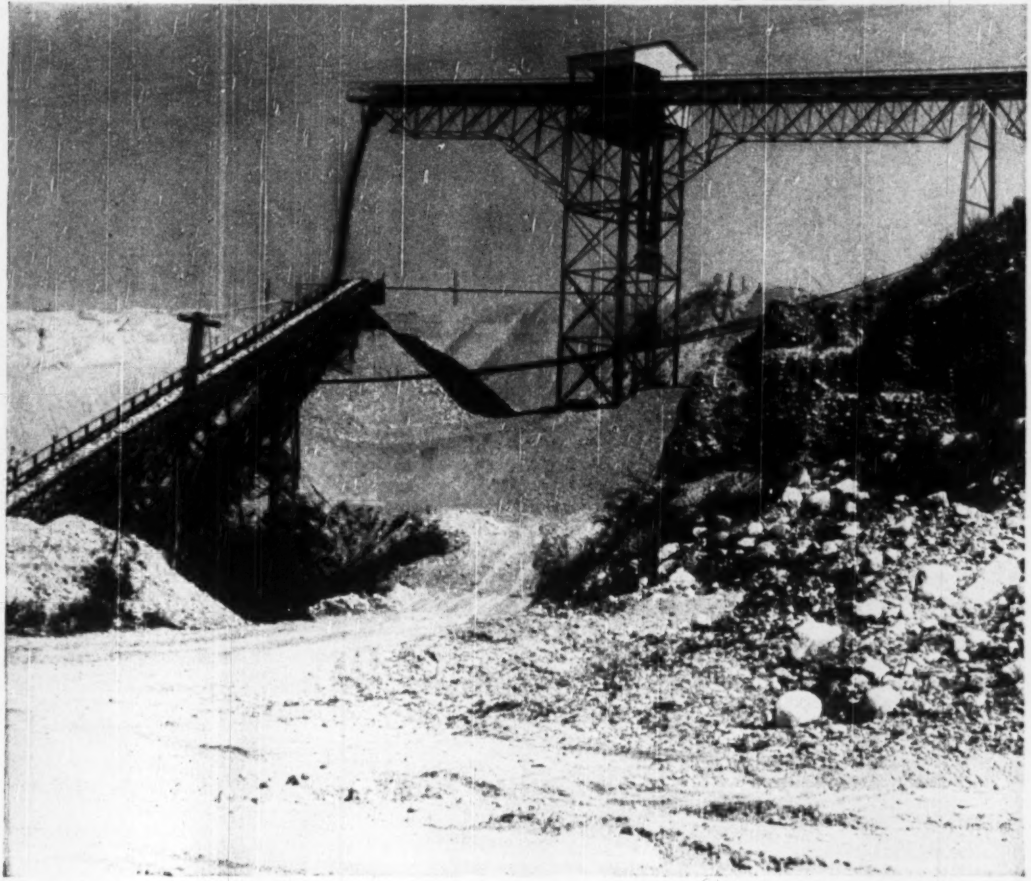
ARMCO

ARMCO DRAINAGE & METAL PRODUCTS, INC.

MIDDLETOWN, OHIO • OFFICES AND PLANTS IN PRINCIPAL CITIES
SUBSIDIARY OF ARMCO STEEL CORPORATION

Structural Plate Pipe and Arches ★ Corrugated Metal Pipe ★ Welded Steel Pipe FLEX-BEAM Guardrail ★ Water Control Gates ★ Retaining Walls ★ STEELOX Buildings Sheeting ★ Tunnel Liner ★ Subdrainage Pipe ★ End Sections ★ Pipe Piling and Pile Shells

RESEARCH KEEPS **B.F.Goodrich** FIRST IN RUBBER



Rubber shovel half a mile long

A typical example of B.F.Goodrich product improvement

WHAT would *you* do if you were in the crushed-stone business and your rock pile began to dwindle?

The nearest new rock was half a mile away from the crushing plant. Engineers first suggested a chain of ordinary conveyor belts that would pass the sand from one belt to the other, like a bucket brigade. But that would be expensive; what was needed was a single belt to do the job. They came to B. F. Goodrich about it.

B. F. Goodrich men knew that an ordinary conveyor belt strong enough to be stretched over a half-mile length would be thick and heavy. For problems like this B. F. Goodrich had developed the cord belt—individual cords suspended in rubber replace stiff, unyielding woven plies.

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ENGINEERING NEWS-RECORD

Member

Volume 145 SEPTEMBER 14, 1950 No. 11

WALDO G. BOWMAN
Editor

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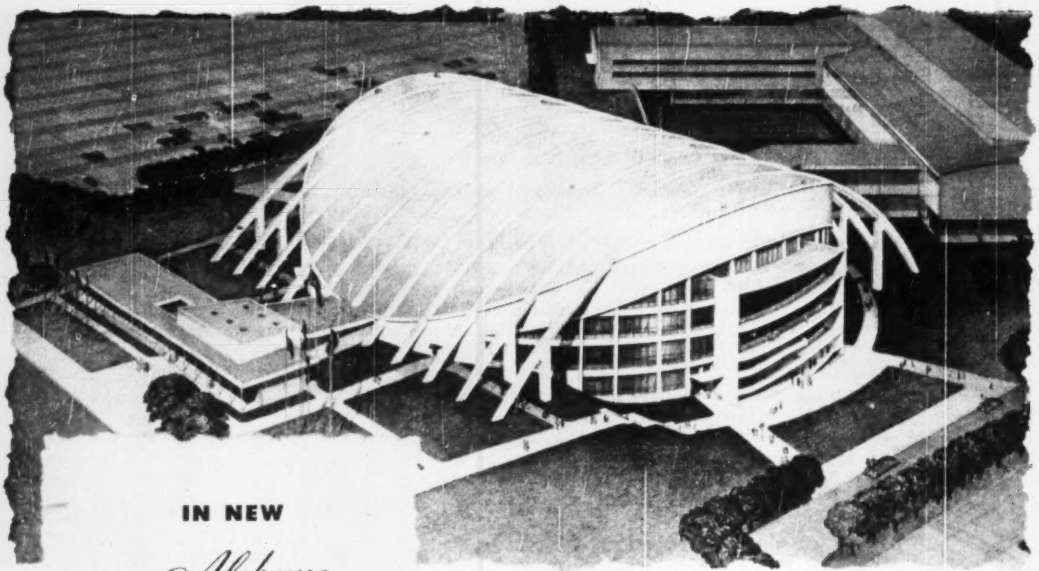


IN NEW

Alabama Livestock Coliseum

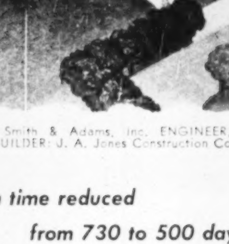
ARCHITECT: Sherlock, Smith & Adams, Inc. ENGINEER, Ammann & Whitney.
BUILDER: J. A. Jones Construction Co.

Construction time reduced from 730 to 500 days

When this striking 1.5-million dollar Livestock Coliseum was being planned for Montgomery, Ala., the architects—Sherlock, Smith & Adams, Inc.—executed *two alternate designs* for the 286-ft clear span, thin-shell barrel roof and ceiling ribs. One design used structural steel, the other reinforced concrete. Bidding showed that concrete cost slightly less than steel. But it was *construction time* that made reinforced concrete the overwhelming choice. The estimate for concrete was 500 days—230 days less than structural steel!

Reinforced concrete not only requires less time to erect—it has many other advantages. It provides a rugged, durable monolith that is inherently firesafe, as well as highly resistant to wind, shock, and quakes. It costs less. And, reinforcing bars, cement, and aggregate are readily available. On your next building, it will pay you to consider reinforced concrete.

Compare!



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of compressor operation by using the air compressor oils exactly suited to YOUR operating conditions . . . TEXACO

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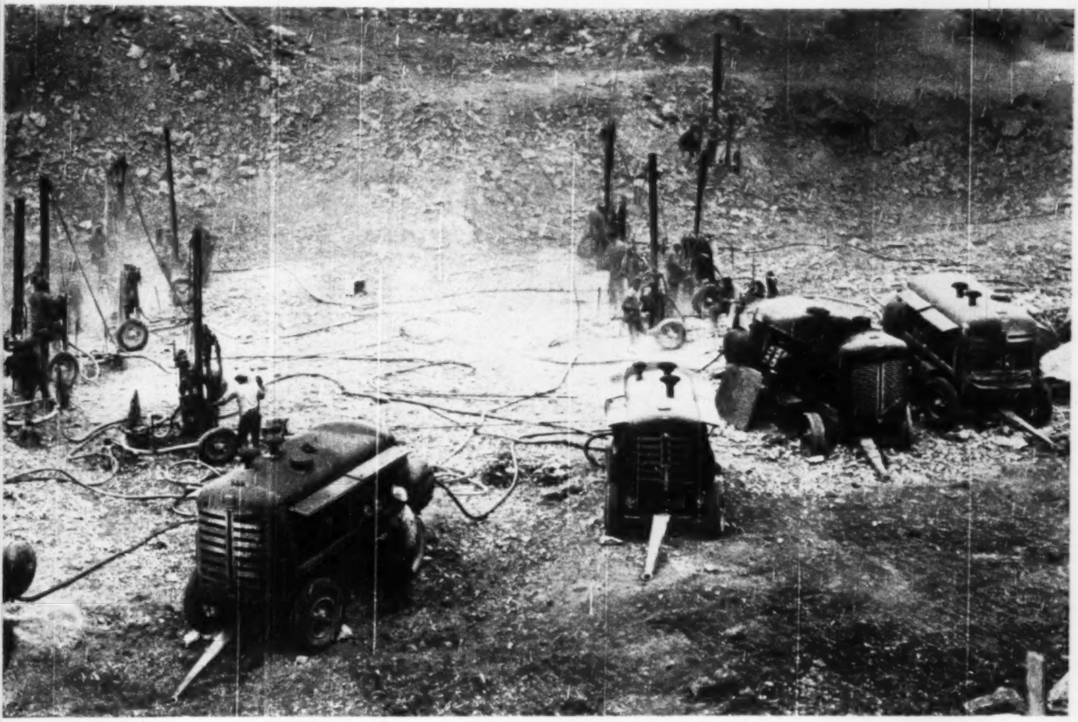

AIR COMPRESSORS operate under a variety of conditions—and there is no one oil that will do a highly satisfactory lubricating job under all of them. But there is a Texaco air compressor oil to meet every requirement. Follow the recommendations of your Texaco Lubrication Engineer and—whatever your conditions—you'll assure more efficient, more trouble-free performance . . . reduced wear and lower maintenance costs.

For instance, where conditions tend to produce rust in any part of the system, there are Texaco *rust-inhibited* air compressor oils designed to prevent it. If service is very severe and carbon and gum are problems, one of the Texaco *heavy-duty* air compressor oils will assure clean operation. Under "wet" cylinder conditions, use a Texaco *compounded* air compressor oil . . . and a Texaco *straight mineral* air compressor oil for normal conditions.

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Lubricants and Fuels

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Completely New Tooth Has 6 Major Features

More and more operators of excavating equipment are specifying the new AMSCO® Rever-SharP

The new Amsco Rever-SharP—designed for use with power shovels, draglines and rippers—is now available in a wide variety of sizes. Th
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work-hardening properti
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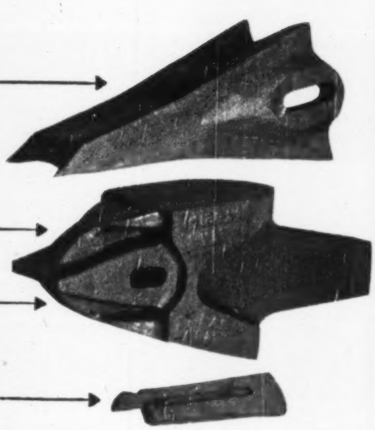

1. **Manganese Steel Construction throughout**—The Rever-SharP actually thrives on hard use . . . *the harder you use it, the harder it gets!*

2. **Reversible Tip**—when the cutting edges of the Rever-SharP are finally worn, simply turn the tip over. *It's self-sharpening.*

3. **Reinforced Cutting Edges**—specially designed extended corners are the first to work-harden, thus equalizing wear along the entire length of the cutting edge.

4. **Heavy, Rugged Adaptor**—extra metal protects base connections and lips. Now available for all base connections.

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6. **Tapered Lock-Key**—easy to insert and remove. Has rubber insert—can't work loose in service.

Enthusiastic users of the new Rever-SharP report higher digging efficiency—and as much as 6 times longer tooth life. *It's a new development worth investigating—write today for the complete facts!*

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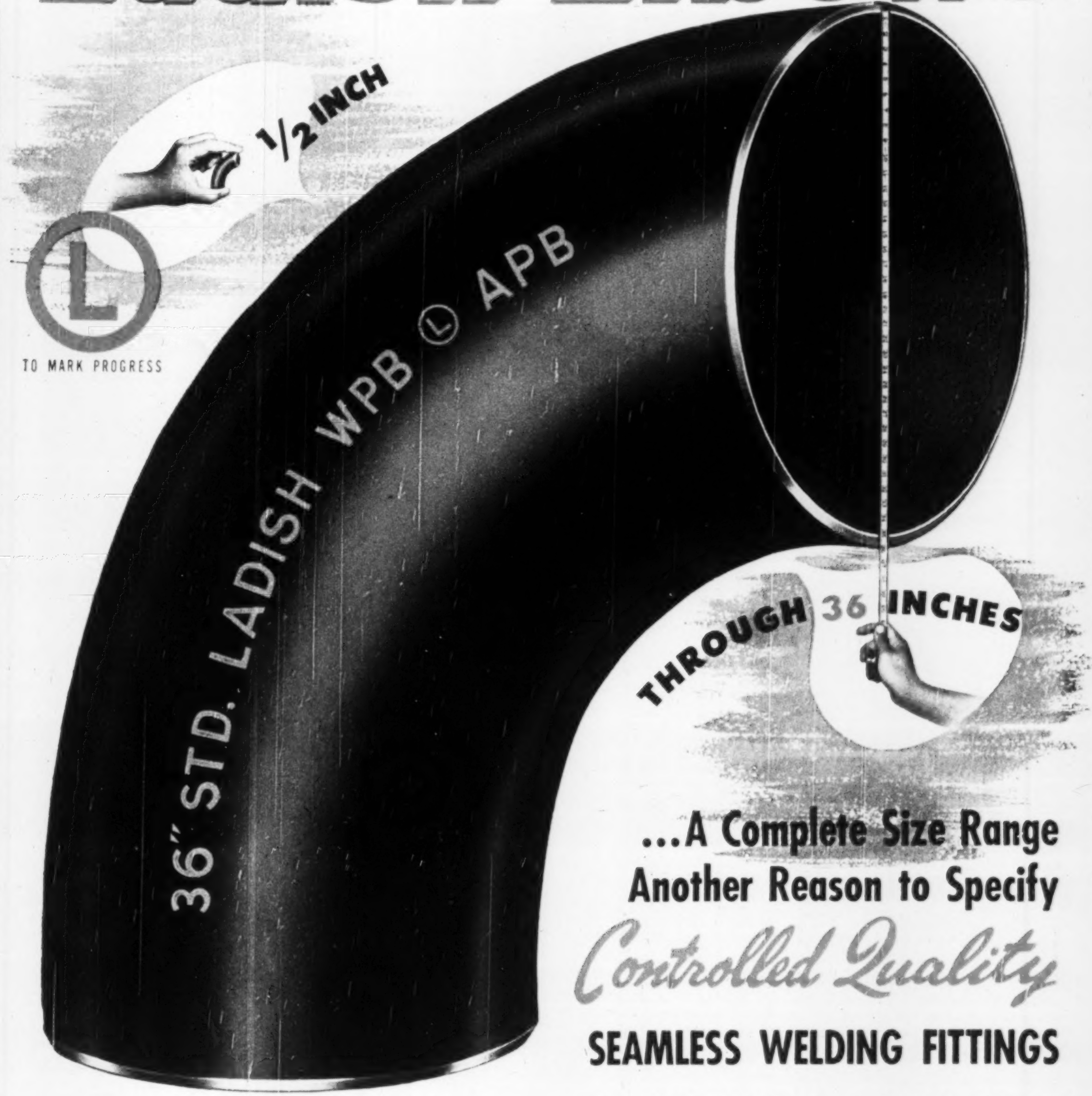
Other Plants: New Castle, Del., Denver, Oakland, Cal., Los Angeles, St. Louis. In Canada: Joliette Steel Division, Joliette, Que.

Ladish Elbows



...A Complete Size Range Another Reason to Specify

Controlled Quality

SEAMLESS WELDING FITTINGS

From the small fitting that weighs several ounces to the half-ton giant . . . whatever your fittings requirement, the Ladish line provides you with an unrestricted choice of sizes in a complete range of types, weights and materials. In addition, every fitting offers the added dependability assured by the high manufacturing and metallurgical standards of Ladish Controlled Quality.

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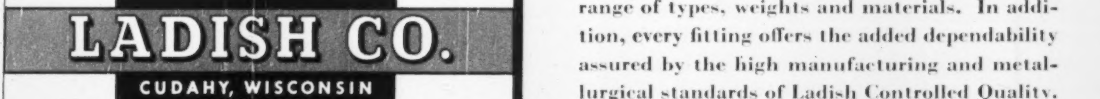


DID YOU SAY "WHO-O-O?"

It's U.S.G. roof deck contractors, of course...who build

SHEETROCK - PYROFILL

T. M. Reg. U. S. Pat. Off.

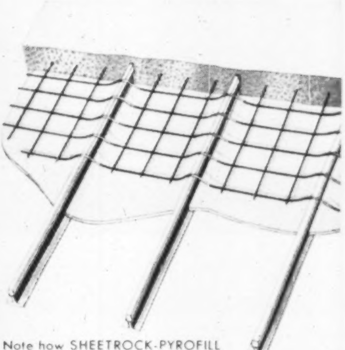
poured-in-place gypsum roof decks

It's always wise to stick to the specifications . . . and specifications that call for SHEETROCK-PYROFILL call for your U.S.G. roof deck contractor. *For only U.S.G. roof deck contractors can install* SHEETROCK-PYROFILL *roof decks.*

Not only does the roof deck they build meet the most exacting requirements because it's incombustible, lightweight, strong, and easy to maintain ... , it meets your construction schedule because SHEETROCK-PYROFILL is quickly installed—up to 20,000 feet poured a day—and sets in less than 30 minutes.

Besides SHEETROCK-PYROFILL, U.S.G. roof deck contractors also erect roof decks of USG Precast Metal Edge Gypsum Plank and Short Span Tile.

For the name of your U.S.G. roof deck contractor, write Industrial Sales Division, United States Gypsum Company, Chicago 6, Illinois.



Note how SHEETROCK-PYROFILL anchors itself to the steel purlins

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For Building • For Industry

Gypsum • Lime • Steel • Insulation • Roofing • Paint

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If your requirements call for transmission or distribution mains of 16" diameter or larger, Lock Joint Pipe Company can provide high quality concrete pressure pipe in all standard diameters and some intermediate sizes. Starting at a minimum of 16", Lock Joint Concrete Pressure Pipe is produced in 32 different diameters, and its four distinct types of structural design cover every working condition common to American water works practice.

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- **IMMUNITY TO RUPTURE OR BLOW-OUT**
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- **EVERY JOINT FLEXIBLE AND WATERTIGHT**
- **EASILY TAPPED**
- **SPECIALS TO MEET INDIVIDUAL SPECIFICATIONS**
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- **MINIMUM MAINTENANCE AND REPAIR COSTS**

Whether your proposed line is large or small it will pay you to use Lock Joint Concrete Pressure Pipe, the pipe of proven durability, economy and dependability.

SCOPE OF SERVICES—Lock Joint Pipe Company specializes in the manufacture and installation of Reinforced Concrete Pressure Pipe for Water Supply and Distribution Mains in a wide range of diameters as well as Concrete Pipes of all types for Sanitary Sewers, Storm Drains, Culverts and Subaqueous Lines.

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Smoother Concrete Finish

WITH GPX PLASTIC-FACED PLYWOOD CONCRETE FORMS

Before GPX, a builder had to grind and point ceilings and THEN apply several layers of plaster in order to get a smooth, finished surface. NOW, by pouring concrete into forms of GPX, the resultant surface is so smooth that, *with a minimum of preparation*, the ceiling can be painted without plastering. Contractors and builders everywhere are finding that the smoother concrete surfaces produced by the use of GPX Concrete Forms save time, work and money.

The inherently smooth, armor-hard plastic surface of GPX gives it unbelievable wearing qualities. The number of re-uses is determined solely by the care with which it is handled and the cutting necessary for pipes and other openings. GPX Concrete Forms, if handled with reasonable care, can be used literally scores of times.

GPX is an extremely high-grade exterior Douglas Fir Plywood with a superior plastic overlay applied under heat and pressure at the time the plywood is being bonded. RESULT: the plastic flows, condenses and sets, forming a hard plastic surface that has become *a part of the plywood itself.*

Investigate GPX today! It is a quality product of Georgia-Pacific Plywood & Lumber Co. with practically unlimited application for building, in industry and on the farm. For further information, write on your firm letterhead or fill in and mail the coupon.

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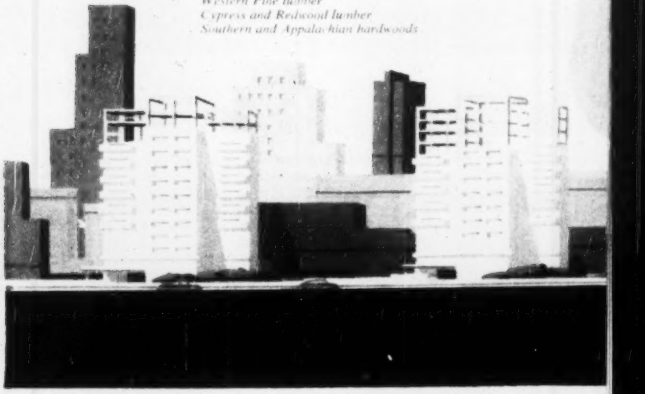

GEORGIA-PACIFIC PLYWOOD & LUMBER CO.
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Augusta, Georgia

Please send me information on your plastic-faced plywood, GPX.

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FIRM NAME..

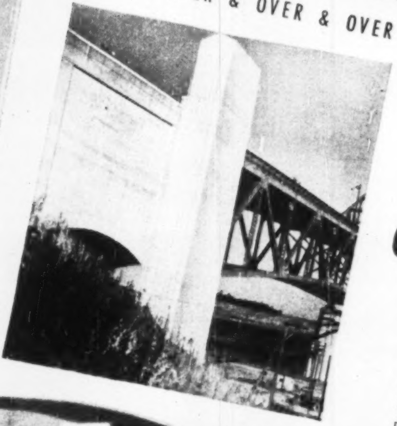
FIRM ADDRESS..

YOUR POSITION..

Investigate GPX for *all* construction jobs!

GPX, Georgia-Pacific's miracle plywood with the plastic face that is part of the plywood itself, is working production miracles in building and construction. Its unique properties include: a satin-smooth, armor-hard surface, extra strength and long life under adverse conditions.

USE IT OVER & OVER & OVER



GPX IS ABRASION-RESISTANT

GPX's armor-hard surface resists the wear and abrasion of concrete mixtures of cement, sand and gravel; the scuffing wear in chutes and other uses where thousands of articles are passed along it constantly.

GPX IS WEATHERPROOF

GPX's inherent qualities resist the most adverse conditions of climate and weather to give long, efficient life, no matter where it is used.

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GPX withstands even tropical rains, humidity and all the extremes of moisture, heat and condensation.

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GPX lasts and lasts long after ordinary materials have checked and cracked and need to be repaired or replaced. GPX's plastic surface combined with high grade exterior type Douglas Fir Plywood is one of the finest building materials available today.

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NEWS BRIEFS

Portland, Me., oil port—With completion of a new multimillion-dollar deep water oil terminal this fall and a second crude oil pipe line to Montreal, Portland, Me., will be near the top of the list as an east-coast oil port. Last year Portland ranked fourth among the coastal oil ports, being surpassed by New York, Newark and Philadelphia only. A major factor in Portland's growth as an oil port is the 236-mile Portland to Montreal pipe line, through which is pumped crude oil for Montreal refineries. About 210 tankers brought oil to Portland last year. The pipeline was built in 1941 as a defense measure. A larger pipeline, parallel to the first, is being built now at a cost of more than $18,000,000, and it is scheduled to be finished by November.

Hard winter ahead?—Although the North Carolina highway commission has been blessed with mild winters for several years it is not going to bank too much on the same being true of the coming winter. It has adopted a policy of not starting any new major construction which cannot be completed by Nov. 1. But there will be a winter maintenance program of widening and improving shoulders, flattening back slopes, roadside work, cleaning out drains, painting center lines, clearing rights of way, etc.

Water costs up, too—A 33% boost in water rates for four suburbs of Cleveland, Ohio, seems likely. The 10-year contract of Cleveland Heights, East Cleveland, Lakewood and Bedford with Cleveland, expired Aug. 1. A similar boost is to be asked of 52 suburbs receiving direct service.

Jefferson Memorial in abeyance—It appears that the long-dreamed-of Jefferson National Expansion Memorial on the river front at St. Louis, (ENR Apr. 10, 1947, p. 1) Mo., will be put off again until general economic conditions are more favorable to a nonprofit enterprise of that kind.

Not just good intentions—From March 31 through June 30, the North Carolina Highway Department surfaced 1,045 miles of roads and stabilized 1,411.5 more in the state's $200,000,000 rural roads program—more paving than ever has been done in any other three-month period in the state's history. Although a detailed cost report has not been prepared, the average cost

(Continued on page 19)

PICTURE OF
A MAN
Saving Money

EASTGATE APARTMENTS

DRIVE-IT "300" *cuts fastening costs 50% on Big Boston Apartment Job!*

Over 9000 drive-pins were used at the Eastgate Apartments to fasten ceiling runner channels to concrete "at a saving of over 50%" writes the contractor.

Drive-It is one of the greatest cost-cutting tools ever invented. Hundreds of letters attest to the fact that steel or wood to concrete or steel fastening can be done with Drive-It *at savings of 50% to 85% in man-hour costs!*

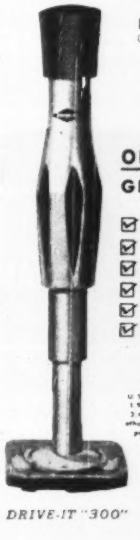
Every architect, building engineer and contractor should investigate the DRIVE-IT system of fastening. It is Underwriter Laboratories approved for efficiency and holding power and engineered for *super-safe* operation.

Clip the coupon below and let us tell you how you, too, can save *safely* with DRIVE-IT!

Distributors Coast to Coast
POWDER POWER TOOL CORPORATION
0703 S. W. Woods Street Portland 1, Oregon
(*Canadian Distributor:*) Ammo Power Tool Co., Ltd.
Foot of McLean Drive, Vancouver, B. C.

ONLY DRIVE-IT "300"
GIVES YOU ALL THESE FEATURES

- ☑ Controlled power with one power charge
- ☑ Positive, 3-way safety
- ☑ Uses flangeless drive-pins
- ☑ Permanent, adjustable safety pad
- ☑ Semi-silent operation
- ☑ Automatic extension barrel



U. S. Pat. No. 1,984,117 2,400,878 other patents pending

DRIVE-IT "300"

and remember for heavy fastening jobs it's the DRIVE-IT "238"

APPROVED BY
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DRIVE-IT

Send me the money-saving story of DRIVE-IT

Name____

Company____

Address____

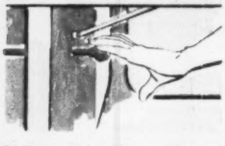
City__________________Zone____State______________

POWDER POWER TOOL CORPORATION, 0703 S. W. WOODS STREET, PORTLAND 1, OREGON

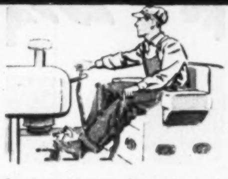
The New INTERNATIONAL TD-24

INTERNATIONAL
TD 24

HERE'S WHAT THE



Positive all-weather starting on gasoline, with quick change-over to full diesel operation, all from the seat.



Separate reverse lever for quick change of direction. The tractor moves in the direction the lever is moved.

Self load and run with scrapers of 17-yard capacity—and shift gears on-the-go with the rolling load.

Cut waste shifting time out of work cycles, provide the best speed for every operation, 8 speeds in each direction!

INTERNATIONAL HARVESTER

INTERNATIONAL

CHAMPION of Crawlers

"The TD-24's work right along on slopes so steep we have to cut them down before other tractors can climb them even without loads," says Bob Rardin of Rardin Brothers, Akron, Ohio. "They are fast tractors, easy to shift and have plenty of power. This combination really moves dirt." His TD-24 was equipped with a bulldozer.

"It will out-buck any tractor I've ever run," says Harold Wooley's operator, Drain, Oregon, "and sure push dirt up hill—and climb steep grades." His TD-24 works regularly on 30% to 50% grades, building mountain roads.

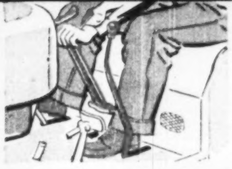
"I wouldn't have anything else," says another Oregon operator. He works for V. R. Russell & Sons of Valsetz. "It's sure fine on bulldozing; best dirt mover I ever got hold of."

That's the way owners and operators talk about the International TD-24 Crawler. It has earned their praise, for it does everything any other big tractor can do, *plus many things that NO other tractor can do*. The TD-24's versatility makes it the most useful and profitable earth-mover in any equipment line-up.

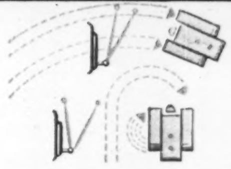
Visit your International Industrial Power Distributor for a demonstration. Then ask yourself how long you can get along without this big red worker and the extra earnings it will produce.

INTERNATIONAL HARVESTER COMPANY
Chicago

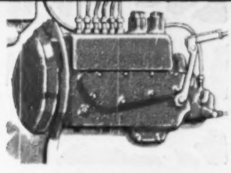
TD-24 CAN DO FOR YOU



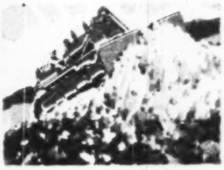
Instant speed change up or down one speed, or stop, without declutching. Planet Power drive does it!



Planet Power steering puts turns with power on both tracks, feathered turns and pivot turns at your fingertips.



Torque Control feature of fuel injection pump increases engine torque when needed to overcome overloads.

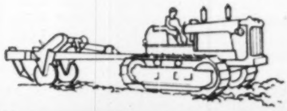


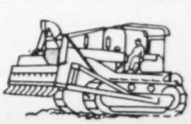
Work on grades up to 100%. Its power, ground contact, balance and lubrication are right for licking any grade.

Handle heaviest loads on gradual turns as easily as straightaway because both tracks are powered in the turn!

Push or pull through tough going. The engine delivers extra "power" when its r.p.m. is pulled down by load.

INDUSTRIAL POWER





GREAT NEW ADVANTAGES IN TRUCK MIXERS

achieved with Chrysler Industrial Engines and Chrysler gýrol Fluid Drive

Reverse rotation of the drum without throwing damaging shocks and impacts into the transmission, engine and other parts of the machine!

No shear pins to replace! Smoother operation! Lower maintenance costs! Longer life! These are only a few of the advantages Chrysler Industrial Engines with gýrol Fluid Drive have brought to operation of truck mixers.

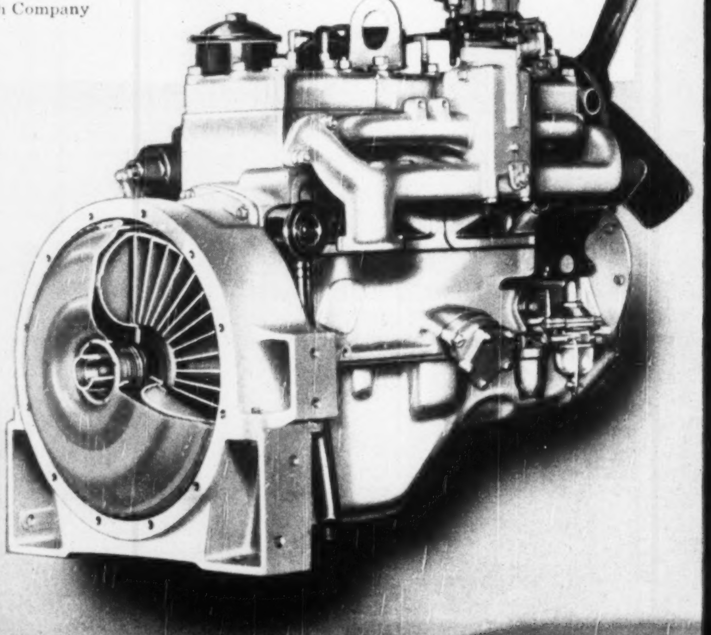
In addition, Chrysler Fluid Coupling prevents engine stalling, reduces clutch wear, eliminates jolts and gear rattle, simplifies starting from standstill with excessive load, gives gradual oil-smooth acceleration—opens a whole new field of improved operation for gasoline-powered equipment. See your Chrysler Industrial Engine Dealer or write us. ***Industrial Engine Division, Chrysler Corporation, Detroit 31, Michigan.***

Chrysler gýrol Fluid Drive Now Available For Truck Mixers From These Manufacturers

Blaw-Knox Division of Blaw-Knox Company
Chain Belt Company
Jaeger Machine Company
T. L. Smith Company

A Typical Experience

Five years ago, a Rex Moto-Mixer equipped with Chrysler Industrial Engine and gýrol Fluid Drive was placed in operation by the Tews Lime and Cement Company of Milwaukee. The unit has been operated continuously ever since, with no down time for engine or transmission repair. Other than minor adjustment of carburetor, no servicing has been needed.



Chrysler gýrol Fluid Drive is built integral with Chrysler Industrial Engines. Its cost is only a few dollars more than the conventional flywheel which it replaces.

CHRYSLER

Industrial Engines and Power Units

HORSEPOWER WITH A PEDIGREE

of the new secondary roads is estimated at $12,000 to $14,000 a mile, compared with the original estimates of $18,000. To date, $32,226,407.82 of the $125,000,000 of bond money available has been spent. The state's secondary roads program has not slowed the betterment of primary highways.

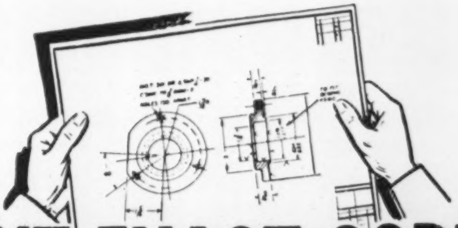
Choose your color–Motorists will see red and black while driving on the new $10,000,000 Calumet expressway, Chicago's link in the Chicago-Detroit expressway. Turn-off lanes and ramps will be finished in those colors to distinguish them from through traffic routes, according to William Mortimer, Cook County highway engineer. Motorists often miss ordinary direction signs, and this experiment is designed to determine whether color is easier to follow. Red-dyed concrete and black top will be used to guide the motorist.

For sidewalk superintendents–Since construction has begun on the subway in Toronto, Ont., public interest in the project is very great. The Toronto Transportation Commission is not satisfied just to provide peek holes for "sidewalk superintendents." It has gotten out an illustrated, pocket-sized folder called "Sidewalk Superintendents' Manual, Grade 1" telling all about the subway and how it is being built.

Warning!–Samuel H. Quigg, 29, of the Humphrey & Quigg Construction Co., was crushed to death Aug. 23 by a bulldozer on one of his construction jobs in Washington, D. C. He was attempting to drive an 18-ton bulldozer onto a trailer truck to move it to another location. Witnesses said Mr. Quigg did not lower the dozer blade to counter-balance the weight of the machine as it went up the ramp. As it reached the top it flipped over backwards, crushing Mr. Quigg underneath.

Big school program–Legislation concerning California's $250,000,000 school construction program will be among that considered at a special session of the state legislature called by Governor Earl Warren for Sept. 20.

It's a gift!–Charles F. Vatterott, a subdivision developer, has made a gift of a $135,000 sewage disposal plant to the city of St. Ann, Mo. The St. Louis County health department says it is one of the best in the state. Previously it had handled the sewage disposal of only four residence subdivisions.



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Copy your drawings, records, and reports *exactly* and *economically* with a Bruning Whiteprinter. You'll get crisp, smudgeproof, errorproof copies — at low cost — and *fast!*

Just place your original on a sheet of Bruning Whiteprint paper and insert both into the Whiteprinter. Within seconds, out comes an easy-to-read, completely developed *positive* print.*

You can make an unlimited quantity of prints — any size up to 42" wide by any length — in black-on-white or any of 20 color combinations. They come out flat, dry, stacked. The last copy is as clean and sharp as the first. Five models offer a complete range of capacities.

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HOW THE CITY OF

ROCHESTER SAVES

$2000.00 PER COVERAGE WITH

STERLING ROCK SALT

FOR SNOW AND ICE REMOVAL

Remarkable Savings Reported When City Switches from Salt and Cinder Mixture to Straight STERLING *Auger-Action* ROCK SALT

READ THIS STATEMENT BY

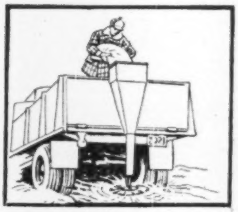
EDWARD F. NIER

Commissioner of Public Works
Rochester, N. Y.

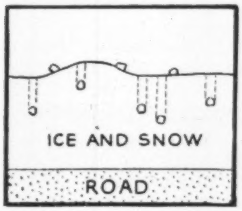
• Mr. Edward F. Nier, Commissioner of Public Works, of Rochester, New York, says . . . "Our experiences in the 1948-49 season taught us that it is cheaper to use straight Rock Salt than a salt and cinder mixture. A load of Rock Salt will cover four or five times as much street surface. In addition, we eliminated the cost of cinders, the added expense of mixing them, and the cost of sweeping them off the streets and digging them out of catch basins.

"More important, however, is the way Rock Salt removes snow and ice, and keeps loose snow from packing and freezing. In previous years we had to spend a good deal of money to chop ice out of gutters, and we had a lot of trouble from street floodings because gutters and catch basins froze up. All this is finished now. The Sterling Rock Salt we put on the streets keeps the gutters and catch basins open, and we have no drainage problem."

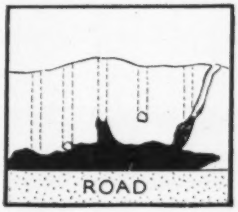
HERE'S HOW IT WORKS



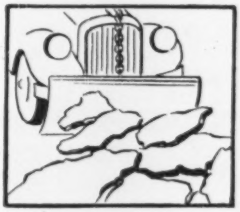
Sterling *Auger-Action* Rock Salt can be used in any mechanical spreader. Requires no special treatment.



Each Sterling *Auger-Action* Rock Salt crystal bores a hole its own size in ice or snow.



Salt crystal reaches pavement . . . becomes brine. Brine breaks the bond between road surface and ice.



Broken ice can be removed with one pass of plow or scraper. Passage of vehicles clears heavy traffic spots.

CITY OF ROCHESTER, N. Y.

Comparative Costs

STRAIGHT ROCK SALT vs. SALT & CINDERS

SALT-CINDER MIXTURE (1947-48) (370 MILES SERVICED)	
COST OF CINDERS	
Delivered Storage Yard, Per Cubic Yard	$ 1.40
COST OF PILING	
Per Cubic Yard	.20
COST OF SALT ADDED	
(150# Per Cu. Yd. Cinders), Per Cu. Yd.	.67
COST OF PILING SALT	
Per Cubic Yard	.20
COST OF LOADING SPREADER	
At Time of Storm, Per Cubic Yard	.20
COST OF SPREADING	
Salt-Cinder Mixture, Per Cubic Yard	.43
SPREADING COST PER CUBIC YARD	$ 3.10
Rate: 3 Yards	3
COST PER MILE FOR SALT-CINDER MIXTURE LAID DOWN	$ 9.30
ADD:	
Spring Cleaning Cost to Remove Cinders from Basins and Receivers	$ 1.50
TOTAL COST PER MILE FOR SALT-CINDER MIXTURE	$10.80

STRAIGHT ROCK SALT (1949-50) (370 MILES SERVICED)	
COST OF SALT	
($9.50 Per Ton Delivered Unloaded Storage Yard)	$ 9.50
COST OF PILING SALT	
Per Ton	.20
COST OF LOADING SPREADER TRUCK	
At Time of Storm, Per Ton	.20
COST OF SPREADING SALT	
(12 Tons Salt, 1000# Per Mile, Truck Cost $.30 Per Mile, Labor $2.20 Per Hour), Per Ton	.85
COST OF SALT LAID	
Per Ton	$10.75
SPREADING RATE:	
2 Miles Per Ton	
TOTAL COST PER MILE USING STRAIGHT ROCK SALT	$ 5.38

OVER $2000.00 SAVED EVERY COVERAGE

STERLING *AUGER-ACTION* ROCK SALT

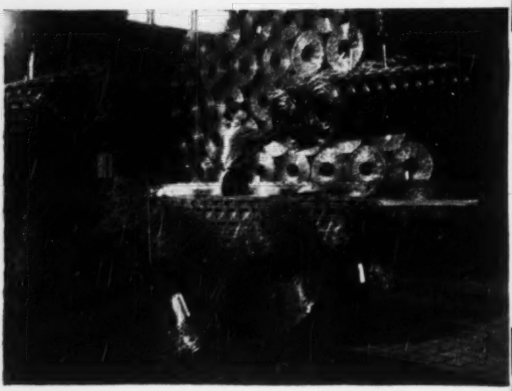
INTERNATIONAL SALT COMPANY, INC.

SCRANTON, PA.

Call Ryerson for Construction Steels

Ryex Expanded Metal

This strong, diamond-pattern reinforcing is available in large or small quantities at your nearby Ryerson plant. It's ideal reinforcing for repair of walls, dams, paving, and for all types of gunite work. It's easy to handle because sharp edges have been completely removed. Wherever flat, rigid reinforcing of good bonding strength is needed, use Ryex. Shipment is immediate.



Welded Wire Fabric

You can fill many of your requirements for welded wire fabric from nearby Ryerson stocks. Perhaps not all requirements, but the fabric you need may be on hand for quick shipment, despite heavy demand. Regular stocks include both plain and galvanized in all commonly used wire spacings and gauges. Our engineers will gladly recommend gauge and spacing that will give necessary strength at the lowest possible cost.

Reinforcing Bars to meet New ASTM Spec. A 305-49

All Ryerson reinforcing bars are made to meet the new ASTM Spec. A 305-49. Great demand has depleted our stocks. However, we will always do our best to serve you. When we have the sizes you need, you'll find Ryerson reinforcing service fast, dependable and complete — geared to start jobs fast and keep them on schedule.

HI-BOND*
Reinforcing from
RYERSON

Hi-Bond Re-Bars

With Hi-Bond Reinforcing Bars, designers can take full advantage of the higher compressive strengths of modern concretes and the higher tensile strength of new steels. Write for Bulletin giving full details. Box 8000-A, Chicago 80, Ill.

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JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CINCINNATI • CLEVELAND
DETROIT • PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO

THE CONSTRUCTION WEEK

TOO GOOD?—Dramatic demonstration that use of the powerfully toxic insecticides now on the market can create serious upsets in nature's balance has occurred in Alabama. Virtually complete destruction of fish and biological life in streams is resulting from the washoff of insecticides that have been used this year to combat the boll weevil in cotton-growing areas. Heavy rainfall apparently has accentuated the run-off from soil in these areas dusted with the insecticide. It has been noted that game fish were killed off quickly, and now the coarser varieties, such as carp, are dying. No ill effects, as yet, have been traced to the use of these polluted waters for potable purposes.

Stream pollution experts from the U. S. Public Health Service have been called in to study the problem. The USPH is running tests at its laboratories in Savannah, Ga. and Cincinnati, Ohio.

SEA WATER DISTILLATION—Western congressmen are pretty well united in support of the President's request for a $25,000,000 authorization to start a large-scale project—with a good-sized pilot plant—to remove salt from sea water for irrigation and other uses. Southern Californians have long supported such an undertaking.

MAPS LACKING—Interior Secretary Chapman did not overlook the opportunity to point out recently how inadequate mapping hampers defense. The Geological Survey could not supply the maps needed for locating an important defense activity. He left it to congress to draw the logical inference: With more money for the Geological Survey, these mapping deficiencies could be corrected.

THE WINNER: PUBLIC POWER—Congress gave the Interior Department what it wanted on controversial transmission lines. Voiding senate deletions, the omnibus appropriations measure granted funds for the Havre-Shelby and Canyon Ferry-Great Falls lines in Montana and for the Brighton-Brush Power line in Colorado.

CENTRAL ARIZONA PIGEONHOLED—Congressional courtesy enabled Chairman John Murdock of the House subcommittee to report the Central Arizona Project bill to the full Public Lands Committee. The subcommittee by voice vote accorded that satisfaction to the congressman from Arizona. After one day's hearings, the full committee tabled the measure for this session. It will have to be re-introduced in the next Congress.

DISPERSAL GETS SECOND CHANCE—President Truman's request for $140 million to move vital Washington agencies beyond bomb range got a quick chill in the House. But the Senate appropriations committee was willing to listen to arguments for adding that item to the $16.7-billion Supplemental Defense Money bill.

BREAK IN RANKS—California congressmen from the northern and southern parts of the state are divided in their opinions of the Reclamation Bureau's united western investigation, now studying the possibility of bringing Columbia River Water to the dry Southwest. Some of the northerners think the water should be brought in, if possible. Southerners still oppose the grandiose scheme as a visionary flanking movement to weaken the state's fight for Colorado River water.

REAL POWER, NOW—This is a minor, but new, power to the President: He may lay down regulations as to terms of credit on construction wholly financed by private money, where that work is begun after Aug. 3, 1950. The power applies to any new building, or any major addition or improvement.

WHAT HAPPENED TO KOREA CONTRACTORS?—American contractors who were aiding the Economic Cooperation Administration on special projects in Korea before the Communist invasion now are being used by U. S. armed forces to perform specialized work on ship-repair programs, airport operations and training missions.

TACOMA NARROWS TOLLS—It will cost about a nickel more per passenger to cross the Tacoma Narrows bridge, which is scheduled for completion Oct. 10—a nickel more than it cost on the bridge's ill-fated predecessor, that is. Fares announced by the Washington State Toll Bridge Authority range from 55 cents for car and driver, to $7.00 for a truck with gross weight more than 66,000 lb.

THOSE ESCALATOR CLAUSES—Whenever construction costs trend upward into an uncertain future, contractors become wary and engineers and architects become cautious. Such a time is here again in the wake of the Korean war, and one of its familiar signposts—the escalator clause in contracts—is beginning to be talked about. For want of such a clause—or so it is said—no bids were received on an offering for a $220,000 utility building at the Kansas City municipal airport. To avoid such a result—and to guard against unduly high bids—architects, Muhlenberg, Yerkes & Muhlenberg of Reading, Pa., are offering an escalator clause on a $2 million county home and hospital for Berks County. During the life of the contract the original unit prices and the sub contractors' prices used by the general contractor can be adjusted up or down a maximum of 10%, the guide being the Engineering News-Record Building Cost Index. An interesting aspect of this proposal is that bidders are asked to submit bids both with and without the escalator feature.

Selective Concreting SAVES TIME AND MONEY ON BEAUTIFUL DAYTONA BEACH BRIDGE

CARLETON-BLANK BRIDGE
ACROSS HALIFAX RIVER, DAYTONA BEACH, FLORIDA
Design and Supervision:
FLORIDA STATE ROAD DEPT., BRIDGE DIVISION
General Contractor:
TIDEWATER CONSTRUCTION CORPORATION
Norfolk, Va.
Incor' (9462 bbls.) and Lone Star (7488 bbls.)
supplied through:
MITCHELL & ALEXANDER, Daytona Beach

- Eye-pleasing Carleton-Blank Bridge across the Halifax River, part of the Inland Waterway, connects Daytona Beach and its beautiful ocean-front, scene of many an automobile and motorcycle speed classic.

Designed by Florida's State Road Department, construction methods reflect concreting experience of a high order. Witness the fact that the General Contractor, Tidewater Construction Corporation, of Norfolk, Va., planned the project to take full advantage of the dependable high early strength of 'Incor' 24-Hour Cement, particularly in the substructure.

Just about half the usual number of forms were required in placing 5293.8 cu. yds. of substructure concrete—and forms cost plenty these days! Elsewhere in the bridge, Lone Star Cement was used.

Selective concreting pays—figure each job with both 'Incor'* and Lone Star . . . use each cement where it shows the lowest cost of concrete in place and ready to use. There's real money to be saved—and often net profit pivots on this point. *Reg. U. S. Pat. Off.

LONE STAR CEMENT CORPORATION
LONE STAR PORTLAND CEMENT
INCOR
'INCOR' HIGH EARLY STRENGTH PORTLAND CEMENT
LONE STAR AIR ENTRAINING PORTLAND CEMENT
LONE STAR MASONRY CEMENT

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LONE STAR CEMENT, WITH ITS SUBSIDIARIES, IS ONE OF THE WORLD'S LARGEST CEMENT PRODUCERS: 15 MODERN MILLS, 27,500,000 BARRELS ANNUAL CAPACITY

CONSTRUCTION AND A $350 BILLION ECONOMY

Contracts have poured in since Korea.

The rush of work this year has mounted so high—46% above 1949—that there's a widespread feeling that 1950 won't be matched for years to come. And certainly, restrictions are likely to bring a tapering off of contracts this winter.

But soon the industry is likely to begin to shade its 1950 peaks. Cutbacks can be only temporary.

How can construction reach new peaks in a half-war half-peace economy?

The answer lies in Washington's long-range plans. A key part of today's mobilization plans is to build up the U. S. enconomy's industrial capacity and supplies of raw materials. As the President put it, "Our main effort . . . must be to concentrate upon production and more production." The aim is to build up American industrial capacity enough to handle both the extra military demands and growing civilian needs.

That can't happen quickly. It may well take five years. And, of course, the Russians can upset the plan at any time. But the target, as put by Leon Keyserling, chairman of the President's Council of Economic Advisers, is to raise the U. S.'s total output of goods and services to $350 billion by 1955.

Earlier—in fact, in only January of this year—the President set a normal peace-time expansion goal: to reach a $300 billion economy within five years.

Today the target is sharply higher. At $350 billion, it is a 30% increase from today's total national product of $270 billion.

(These figures, incidentally, are in pre-Korea prices. As prices are going now, and with industry working under high pressure, the U. S. will have a $300 billion economy sometime this winter. But the figures here assume stable prices to give a picture of real growth.)

In the past, it has taken a high rate of construction to produce anything like that fast an expansion. In the 1920's, for example, about 11% of our gross national product went into private and public construction. In the early 1930's, when the economy was declining or growing only very slowly, only 7% of our national product went into construction.

In short, in an expanding economy, almost one-half again as large a share of our national output goes into construction as in stagnant times.

Much the same thing happened in the early years of World War II. To meet war demands, construction grew to the point where in 1942 it represented about 9% of our gross national product. Today—when the economy is again expanding rapidly—construction is running 10% of the national product.

Today mobilization plans are limited. There's not the rush to build training camps and military bases. And—aside from priority industrial expansion—most types of construction will be cut back within the next twelve months.

After that, though—and barring all-out war—construction will be called on for a greater effort than ever before, if the U. S. is to have a $350 billion economy. A 30% rise in production in five years calls for a long period of heavy construction activity.

Look at the picture by industries. Washington is reported calling for a 15% to 20% expansion in steel. That's fifteen to twenty million tons of steel-production increase in a year.

Utilities are racing to expand. They ordered 140% more equipment from General Electric in the six weeks after Korea than they had in the whole six months before it. Other electrical equipment makers have their capacity booked solidly for two years.

Other industries whose products are essential to defense production—aluminum, manganese, chrome, many chemicals—also will expand.

Beyond that, virtually all industry must expand to meet growing civilian demand. The U. S. population will continue to grow at the rate of about two million a year. In 1955 as the Census Bureau forecasts it, the U. S. will have between 158 and 166 million people—as compared to 151.4 million today.

Mobilization also builds up incomes and demand for goods. At the same time, restrictions cut down production. So, once the mobilization levels off, there'll be a high level—and probably higher than it is today—of civilian demand to be satisfied.

Construction is a clear case. Mobilization will shift construction toward defense needs. And, even with a relatively high level of civilian construction going on, the economy will expand enough to build up a backlog of needed construction work. Since the industry goes into this mobilization period with almost $50 billion in prospective work in its backlog, it's sure to have a high level of work in the years ahead. Five years from now, construction may well be doing 20% more volume than it is now.

All this assumes no general war. But if we do have all-out war, construction will go all-out on war jobs—and an even greater backlog of civilian projects will grow.

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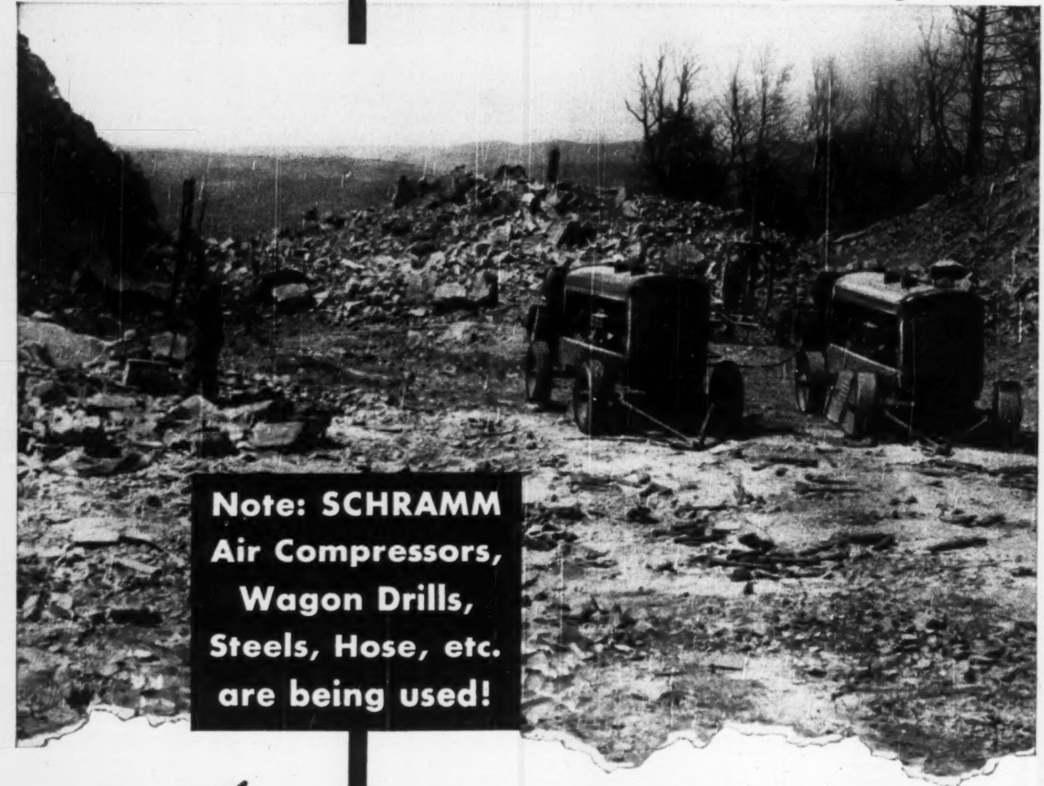

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EDITORIALS

Dangers in Controls

Granting the President the right to impose controls on our economy—as Congress did last week—should not be tantamount to their quick and general imposition. One has only to consider Great Britain's heavy plunge into government controls of the construction industry—particularly in housing and materials—to see the wisdom of staying away from such restrictions as long as possible.

R. O. Lloyd, head of the British team of building trades employers that made a several-month study of the U. S. construction industry, returned home with the conclusion that government controls were the reason that British housebuilding was making such a poor showing. Much of the steam in the U. S. housing boom, he is sure, stems from the lack of controls.

In Britain, there is an arbitrary limitation on the number of houses that can be built for owner occupancy in relation to local public-authority housing. There are limitations on the amounts and kinds of building materials that can be produced, which restricts designers and contractors in exercising their ingenuity. There are permits to be obtained, which cause delays. And the slow and uncertain delivery of materials keeps the workers from doing their best for fear they will work themselves out of a job.

All these consequences of government controls are familiar to the U. S. construction industry from wartime experience. Now that we are sliding again toward a system of controls is a good time to recall for ourselves, as Mr. Lloyd did for his British countrymen, how well the U. S. has done without them. Now that the legal power exists to impose controls is a good time to urge that the step be taken only after the greatest certainty of necessity.

How to Save Steel

Extra effort made now by designers and builders to conserve steel will pay dividends in many ways. Steel has been in short supply for some time, and the situation apparently is going to get worse. As the military needs of the nation are met, the amount of steel available for civilian uses will decrease. To minimize the effect of the shortage on the construction industry, more efficient use must be made of the available supply.

Two important conservation methods are suggested in articles in this issue—welding and pre-stressing.

Steel can be saved by welding plate girders or trusses, instead of riveting. Sometimes, also, a saving is achieved by substituting built-up welded members for rolled sections. Often, supporting members can be lightened further by utilizing the concrete slab to carry part of the load—using a composite beam design, with shear developers to transfer stress between the slab and the compression flanges.

Better welding specifications are another source of steel saving. Those in existence perpetuate riveted construction practice that in some cases is not realistic for welding. As the welded bridge article in this issue emphasizes, some of the specification restrictions on deflection, web thickness, weld sizes and stiffeners limit the steel savings, and thus are subject to question.

As applied to reinforced concrete construction, butt welding of reinforcing to eliminate laps can also save steel. Where the sizes of members are determined by clearances at the lapped bars, welding the bars may make possible reduction in the dimensions of the members, thus saving cement and formwork as well. Furthermore, a more reliable splice results—an important consideration in the resistance of a structure to lateral and uplift forces, such as from an atomic blast (ENR Jan 26, p 24).

Prestressing cuts steel requirements primarily through the substitution of high-strength steel (working stresses over 100,000 psi) for low-strength steel (working stresses under 25,000 psi). Applied to concrete, prestressing can also save cement and formwork, since the full concrete section carries stress.

Designers and builders who switch to welding or prestressing may find a pleasant surprise in store. Not only will they be conserving steel, but they probably will find that they are saving money, too.

Science Foundation

President Truman hopes to get Congress before it adjourns to pass a bill appropriating enough money to permit the National Science Foundation to be organized. The bill has been sidetracked in the Senate and was rejected by the House on the ground that it would not aid the nation's defense effort. That seems to be strange reasoning because it was the backward condition of research in this country, which was highlighted when this country began speeding up its defense effort at the start of World War II, that started the movement which resulted in passage of the act establishing a National Science Foundation. The appropriation requested is small by today's standards—$475,000—yet it could easily result in savings of many times that amount. Indeed such an expenditure would be justified if the initial organization did little more than provide a central clearing house through which research needs could be channeled to the most appropriate research center. And if all needs had to be reported to the foundation before a research project could be set up, much costly duplication of effort could be avoided.

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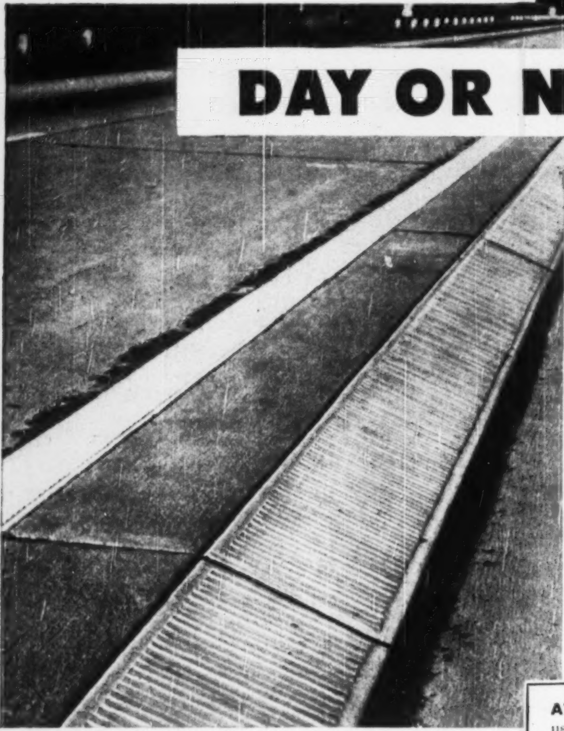

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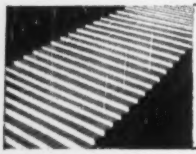

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ENGINEERING NEWS-RECORD

SEPTEMBER 14, 1950 VOL. 145 NO. 11

How agencies will handle controls for construction

President's executive order putting Defense Production Act into effect scatters duties among bureaus qualified to do work; makes NSRB coordinating group

At least four government agencies are going to administer controls that directly affect construction under the Defense Production Act. President Truman's executive order of Sept. 9 made that fact clear.

Delegation of the defense powers to a number of existing agencies had been expected. Such widespread division of authority looks bad on its face, but the use of experienced departments and units to exercise controls in their special fields has some advantages.

In general, the distribution of controls follows the pattern of putting powers where there are experienced people to handle them. Priorities and allocations for most construction materials were assigned to the Commerce Department. But the Interior Department was given responsibility over priorities and allocations of materials and equipment that go into facilities for electric power, oil, gas and coal.

• **Federal Reserve handles most financing**—Overall control of credit for financing new construction was delegated to the Board of Governors of the Federal Reserve System. But there was an important qualification in this assignment: On regulations involving residential property, the board must have the concurrence of the Housing and Home Finance Administrator. The added requirement recognizes the obvious fact that government credit policies on residential mortgages set the pattern for the entire home financing market.

As an essential corollary, the President's order put all authority over government housing credit—within the purposes of the Defense Production Act—under the HHFA administration. The consolidation pulls together the divided responsibilities of the HHFA and the Veterans Administration. Hereafter, the HHFA administrator will be responsible for increasing down payments or shortening maturities on VA-guaranteed loans as well as on FHA-insured mortgages.

Two types of government aid are provided in the law and in the President's order for building new plants or expanding old ones in order to increase productive capacity. First, government agencies—the Army, Navy, Air Force, Commerce, Interior, Agriculture, and the General Services Administration—may guarantee financing institutions against loss on loans that will expedite production, deliveries or services for the national defense. The Federal Reserve Banks are authorized to act as fiscal agents for these guarantee contracts.

Second—and equally important to construction—the RFC can make direct government loans to private enterprises for expansion of capacity, development of processes, and production of essential materials. Need for the loans must be certified by officials whom the President designates, like two specifically named in the order: The interior secretary for metals and minerals and the secretary of agriculture for lumber. The act authorizes immediately Treasury advances for loans up to $600 million, with $1.4 billion more to be appropriated by Congress if necessary.

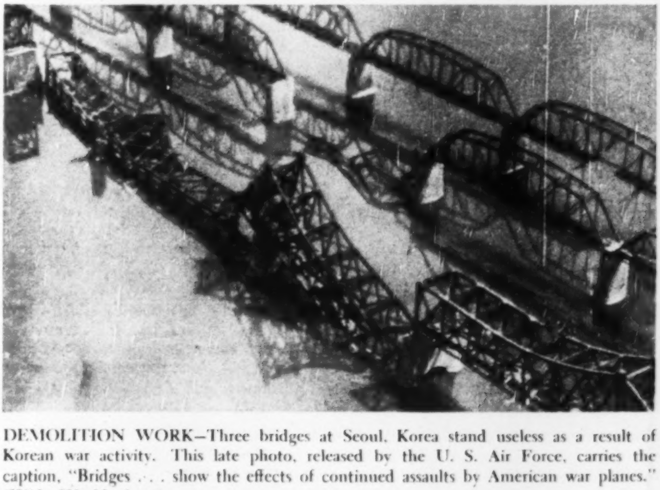
Price and wage controls were not requested by the President but were enacted in the law. They may be applied on the selective basis originally voted by the House or clear across the board, as advocated by the Senate. If price ceilings are established for an industry, wage ceilings must be put in effect simultaneously.

• **Base-period records must be kept**—No necessity for use of the wage-price powers is foreseen by the administration in the near future, but the President has stated that he will invoke them if voluntary cooperation by management and labor should fail. He has ordered all businessmen to keep price and cost records for the May 24-June 24 period mentioned in the law, as a base to use for determining future ceilings.

• **NSRB coordinates**—All of the delegated functions, the President directed, are to be coordinated by the chairman of the National Security Resources Board. His duties make him the top official—under the President—of the defense controls setup.

Coordination will be needed on all aspects of the defense production program. Allocation control is an ex-

(Continued on page 30)



DEMOLITION WORK—Three bridges at Seoul, Korea stand useless as a result of Korean war activity. This late photo, released by the U. S. Air Force, carries the caption, "Bridges . . . show the effects of continued assaults by American war planes." (Wide World photo)

Boston engineers quit; charge payroll puff

Karl Kennison and two others resign; chief construction engineer had no authority to certify employees

Boston's Metropolitan District Commission was shaken to its foundations last week by the resignations of three of its top-flight engineers.

Heading the exit was Karl R. Kennison, chief engineer of MDC's construction division for the past 12 years who made it clear that his leaving is a protest against political conditions. Resigning with Kennison were Stanley M. Dore, deputy chief engineer, and Lawrence M. Gentleman, designing engineer.

- **Politics blamed**—Both Kennison and Gentleman charged that the efficiency of the engineering organization has been undermined by politics. It was pointed out that this condition was not solely due to Democrat or Republican influences, but that both parties were responsible for heavy increases in payrolls and expansion of personnel. Kennison said that some years ago the construction division office was under control of the chief engineer, but it was then divided into an administrative branch and an engineering branch, a man from the Boston city hall being brought in to run the administrative work.

The former chief said that the water construction division had 336 permanent employees and a total payroll of $82,321 in August, 1949 compared with 549 employees and a payroll of $136,500 last month. On some jobs there were too many inspectors, but the chief engineer was told to use them whether he wanted them or not. Kennison charged that the chief engineer had no voice in the selection of inspectors.

- **Readers Digest cited**—Calling attention to an article in the June issue of Reader's Digest by Fulton Oursler entitled "Twilight of Honor," Kennison said that country-wide conditions described in that article apply to the MDC situation in Boston. He pointed out that the commission had been made aware of the unsatisfactory conditions in the MDC as long ago as 1947.
- **Commission says engineers are impetuous**—District commissioners issued a joint statement Friday night characterizing the comments of the resigning engineers as impetuous. The board declared that the opportunity to express these views had long been available; that the MDC has in progress the largest project program in its 60 years' history; and that increased payrolls and personnel employed were a natural concomitant.

In rebuttal, Kennison and Gentleman stated that with the exception of two projects all of some 40 projects listed by the commission were projects of its parks division and not of the construction division.

Controls organization . . .

(*Continued from page 29*)

ample. An agency charged with allocations authority has a two-fold function to perform: It both allocates commodities from its own field to all industry and also acts as a claimant for the materials and supplies needed by its own industries.

This two-way job is illustrated by interior's responsibility for the power industry (noted elsewhere in these pages). In addition to allocating electric power among industrial consumers, Interior also will allocate supplies and materials to construction and improvement projects within the power industry. Once the latter allocations have been decided upon, Interior becomes a claimant for the needed supplies and equipment from other controls agencies—principally the Commerce Department, which handles industrial materials and products.

Similarly, Commerce cannot allocate electric power equipment to a new industrial plant without first getting an allocation for the equipment from Interior.

Steel, copper and aluminum will be the first construction metals to feel the effect of controls. Priorities for defense contracts will take only a small percentage of the total production of these materials, but in the present tight market the drain may have severe consequences. Such a result would increase the pressure for allocations.

- **Commerce is ready**—Weeks before the Defense Power Act became law, Commerce secretary Sawyer began organizing a National Production Authority in his department. He chose William Henry Harrison, president of International Telephone and Telegraph Co., to head the new outfit. Several businessmen joined Harrison in top jobs a couple of weeks ago. The agency became a reality the first of this week.

Commerce planned two main divisions for its controls administration: (1) An Office of Requirements—the top allocator—which will add up the demand for critical materials and balance that demand against supply; and (2) an Office of Industry Operation, which will be the claimant for industries under the Commerce wing and also the agency to parcel out allocations after they have been decided on.

Power men will write material-control rules

Interior Department asks leaders to meet for purpose of setting up construction allocation criteria

Power company executives will be called to Washington to write the ground rules for materials allocations within their own industry—public as well as private. This action will be under authority of the President's order putting into effect the Defense Production Act. Interior will handle power-industry allocations.

A power advisory council will be an entirely new undertaking. The Interior Department already has advisory councils for petroleum, minerals and bituminous coal. The experience of these councils gives them a useful basis on which to build their allocations machinery.

For the new Power Advisory Council, writing the allocations criteria will be its first and probably most important job. Only two public power representatives will sit in with the large group of private utility executives to draft the ground rules. One of them will represent TVA, and the other will be appointed from the Interior Department—somebody like Paul J. Raver, administrator of the Bonneville Power Administration.

These two representatives will be present for only one purpose—to see that public power interests are not overlooked or forgotten in the discussions. Their voices will be a small minority in the large gathering, but their words will carry weight. After all, the criteria have to be approved by the Interior secretary before they go into effect.

Once the private power people have developed the basic standards for parceling out materials and equipment among industry construction projects, Chapman is willing to bet his job that he can apply the same rules clear across the board, to public as well as to private power operations.

Navy A-E contracts

If you want a Navy Design contract, for architectural or engineering services, the place to start is the Navy district public works office in your naval district. Two weeks ago under "How to sell services and supplies for Defense-Department construction," ENGINEERING NEWS-RECORD erroneously advised direct contact with the office of the chief of the Bureau of Yards and Docks for this purpose.

What's behind wild lumber prices

Vincent B. Smith
Associate Editor

Lumber prices have been on a binge for six months. But a somewhat painful sobering-up process may start within 60 to 90 days, many lumbermen believe. Violent price fluctuations seem to be part of the cost of getting lumber from an industry that is loosely hung together.

Lumber production and distribution are carried on through thousands of independent, competitive units. Big companies supply only a fraction of the output. The four largest produce about 5% of the total.

That situation is quite different from most industries supplying construction materials. In lumber, 65,000 sawmills will produce some 37 billion board feet this year, probably the highest in a quarter century. About half of the production will come from the top 1,100 of the big mills. Nearly 4,500 additional mills will take care of the next 25%.

For the remaining output—which really determines the top limit of production for the year—60,000 small backwoods part-time mills will have to push themselves, spurred by the incentive of high prices.

• **Competition sets pattern**—Under conditions in the industry, the larger companies can exercise no practical direction or control over prices. When the pressure is upward, all elements of the industry—producers, wholesalers and retailers—tend to follow the lead of the competitor who is getting the highest price.

Several factors have pushed prices up sharply in recent months. Basically, the unprecedented housing boom—with nearly 1,000,000 new homes already started this year—caused a bulge in lumber demand that the industry could not anticipate. Spotty shortages of various lumber items around the country then led to scare buying for stockpiles by builders. Since Korea, shortages of railroad cars and some slowing of water transportation have further aggravated a serious situation.

Buyers today are commonly reported to be offering and paying bonuses for lumber deliveries.

• **Prices can't go much higher**—Many lumbermen feel that buyers cannot go much higher in the prices and bonuses they are offering. Government credit curbs on home financing, they think, will begin to have some effect on demand in the next two or three months. Other restrictions on private financing of new construction may be in force by that time.

If these limitations—reinforced by more cautious policies on the part of lenders—take the edge off the building boom, the inflation in lumber prices may come to a quick stop. Some adjustment of lumber prices then would occur, although they could not drop to the level of last year.

Rises in costs and in the general price level for all commodities would prevent any such decline. Even without the pressures of scare buying and shortages, lumber prices would have gone up some. Wages and other costs are higher than they were in 1949.

Lumber prices should regain a semblance of stability if consumption can be reduced to about 32 billion board feet, according to spokesmen for the producers. Somewhere in the 30-34 billion range, they say, is a production level that can be supported by the big, permanent mills and the thousands of smaller outfits that normally operate in the business.

• **Monopoly unlikely**—Is there any possibility that the lumber industry may become more stabilized through concentration of capacity in a few big companies?

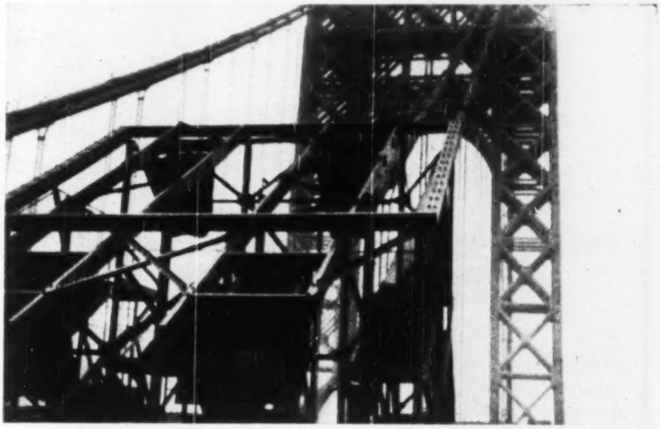
The chances for this are remote. In fact, lumber people think that the trend is likely to continue in the opposite direction.

During the last ten years particularly, there has been a significant increase in the number of small mills and in the percentage of annual production turned out by these mills. The transition has been steady, apparently inevitable. It is not likely to be reversed.

The trend, therefore, indicates no lessening of independent, competitive operations in the lumber industry.

HOW LUMBER PRICE INCREASES COMPARE WITH OTHER BASIC CONSTRUCTION COSTS

Construction cost element	Price increases (%) since: Sept. 1939	Sept. 1945	Sept. 1947	Sept. 1949
Lumber	252	93	25	35
Struct. steel	64.5	64.5	21.5	4.5
Cement	36	22	8.5	1
Common labor	128	70	26.5	5.5
Skilled labor	78	53	21.5	4
Cost Index				
ENR Constr.	126	71.5	24	11
ENR Bldg.	100	64	22	11.5



GOING UP—Workmen who are adjusting bolts on the collars by which the suspenders are connected to the cables of New York City's George Washington Bridge will ride this car from the roadway to the tops of the towers. It's the first time this job has been done on the 19-year-old bridge. There are 3,360 twenty-eight-inch bolts to be measured under existing tension. Then each nut is loosened, re-measured and tightened again to a tension of 100,000 lb, then measured a third time. The cars from which all this is being done are of aluminum, specially designed for the job. They ride the cables on rubber-shoed rollers, dragged by winches atop the 600-ft towers. The job began recently, will be interrupted soon, resumed in the spring.

Unusual safeguards bring low bond rate

Linden Roselle Sewerage Authority borrows $3,850,000 at 2.109% interest; lowest in many years

The Linden Roselle Sewerage Authority (New Jersey) has sold a $3,850,000 revenue bond issue, at 2.109% interest, for construction of new facilities. The issue is exempt from federal and state taxes.

According to bond counsel, the interest rate probably is the lowest for a sewerage authority in many years. (A lower rate was obtained by Hampton Roads, Va. in the thirties.)

Two reasons are given for the low rate: (1) prospective increased federal income taxs have made tax-exempt securities more attractive; (2) this particular revenue bond is unusually well protected for the investor.

The authority deals with its component municipalities, Roselle and Linden, rather than directly with property owners. Therefore, the authority has no overhead expense for billing service. The municipalities handle the billing (by an ad valorem tax on property). However, the authority has the right to bill each user in the event of default by a municipality. A complete rate schedule already has been established for such direct-billing purposes. In addition, the authority has a lien on property.

The authority also deals with 20 industrial plants, charging them for service in excess of that warranted by their property taxes. If an industrial user delivers into the system more than 34,000 gal. per $1,000 assessed valuation, and more than 85 lb suspended solids per $1,000 assessed valuation, both per year, the authority charges the industrial user for additional service.

This means that the authority has a total of 22 customers; without the billing-by-the-cities provision, the authority would have to serve about 15,000 customers.

The project includes a 12.5 mgd treatment plant, a main interceptor, a plant outlet flume, and deep-water docking for sludge vessels. Sewage receives primary treatment; sludge is barged to sea. Consulting engineer for the project is M. H. Klegerman, of New York.

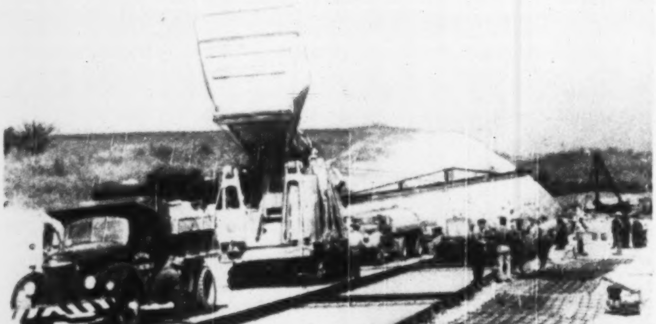
◆

Nebraska gives in a bit when asked for cost-plus

Construction of a 480-bed building at the Norfolk, Neb. State Mental Hospital is under way after an agreement between the state and the low bidder modifying a cost-plus-percentage stipulation of the contractor's bid. A. Borchman & Sons Co., Omaha, has contract at $959,797.

In response to the state's call for lump sum bids on the hospital, Borchman and the remaining four bidders submitted bids stipulating identically-worded war clauses, providing that if the contractor were forced to shut down because of hostilities, he would be paid all costs, plus 10%.

The war clause was replaced by an agreement that if conditions boost the cost of materials or labor by 7 percent, the state will consider freeing the Omaha firm from its contract.



PAVING BEGINS on Western extension of Pennsylvania Turnpike. Concrete placement now is under way on this last link in Pennsylvania's east-west trans-state toll route. Western extension's 67 miles will bring total to 327. (Wide World photo)

Montana defers road jobs rated as non-essential

About half of Montana's state road and bridge projects scheduled for contract letting September 21 have been taken off the list because of national-defense considerations.

This action is in response to a July request by the Bureau of Public Roads to the effect that a review of road-building programs in Montana should be made. All projects are classified "essential" or "non-essential" to national defense. The essential projects include work planned on U. S. highway 10 extending east and west across southern Montana; U. S. highway 91, crossing the state north and south, and U. S. highway 87, from Billings southward to the Wyoming state line.

All secondary road projects are listed as non-essential, unless they serve lumbering areas or strategic metal-mining operations.

• **California goes ahead**—In similar circumstances the California Highway Commission is ready to adjust the state highway construction program to any turns which the Korean war may take, but highway development will continue on schedule as long as permitted, C. H. Purcell, state director of public works, has stated.

"Highway development is essential in peace or in war and we are determined to proceed with state highway development . . . as long as such a policy is not inimical to the national welfare," he said.

◆

Money agreement reached on Canada's Fanshaw Dam

With the completion of financing agreements, the way now is clear for construction of Fanshaw Dam, for water conservation and control on the Thames River in southwestern Ontario. Seventy-five percent of the $4,000,000 cost will be shared by the dominion and provincial governments, and the remaining 25 percent will be borne by local municipalities on the basis of proportionate benefit. London, Ont., will be the principal beneficiary.

The dam will be located six miles upstream from London, which frequently is threatened by Thames River floods. The city also will use the reservoir to supplement domestic water supplies. (Supplies now are taken from wells.)

Reservoir capacity will be 42,000 acre ft. to be impounded behind an earthfill structure. About $80,000 already has been spent at the site; contracts for first-stage work have been let tentatively to the Foundation Co. of Canada.

Federal construction money up 29%

Mandatory cutback and supplemental appropriations still to come

CONSTRUCTION MONEY IN THE GENERAL APPROPRIATION ACT, 1951, (PUBLIC LAW 759), except as noted.

	Contract Authorizations	Appropriations	
	1950-51	PL759, 583d, 616 1950-51	PL146, 71d, 119d 1949-50
Dept. of State			
International Boundary & Water Comm.		$3,000,000	$900,000
Dept. of Justice Federal Prison System	($700,000)	800,000	497,000
Dept. of Commerce			
Civil Aeronautics Administration			
Federal-aid airport program	($36,700,000)	37,000,000	14,500,000
Public airports, Fairbanks & Anchorage, Alaska		3,200,000	5,800,000
Def. Act PL 583		4,500,000d	
Washington National Airport		540,000	196,500
Bureau of Public Roads		412,100,000	407,570,000
Federal-aid highway program		(385,000,000)	
Elimination of grade crossings		(4,600,000)	
Forest highways		(22,500,000)	
National Bureau of Standards	($5,675,000)	500,000	
Federal Security Agency			
U. S. Public Health Service			
Hospital construction program	($150,000,000)	100,000,000	33,000,000
Research facilities construction	($350,000)	15,125,000	
National Cancer Inst. Constr. grants		5,000,000	
National Heart Inst. constr. grants		4,459,000	
St. Elizabeth's Hospital	($3,938,000)	1,500,000	2,844,000
Howard University		1,662,000	5,659,425
Def. Act (1949-'50)			394,460d
Dept. of Agriculture			
Soil Conservation Service		500,000	52,173,800
Forest service roads and trails		16,348,000	10,348,000
Flood control		10,315,000	9,500,000
Department of Interior			
Bureau Reclamation	($3,000,000)	295,828,000	331,461,638
Def. Act PL 583 1949-'50		1,625,600d	18,375,000d
Bonneville Power Admin	($20,000,000)	39,500,000	26,284,500
Def. Act PL 583 & 1949-'50		680,000d	6,047,500d
Bureau of Indian Affairs	($3,500,000)	23,272,651	12,627,951
Def. Act 1949-'50			4,580,000d
Bureau of Mines		1,268,100	250,000
National Park Service		19,667,000	11,421,000
Def. Act 1949-'50			304,800d
Fish & Wildlife Service		2,423,450	625,500
Bureau of Land Management		700,000	
Southwest Power Admin	($1,730,000)	8,620,000	
Alaska Road Commission	($8,000,000)	20,400,000	41,920,700
Alaska Railroad		30,000,000	
Geological Survey			13,375,000
Independent Offices			
Atomic Energy Commission	($300,150,000)	390,000,000	296,000,000
Veterans Administration		160,000,000	
Tennessee Valley Authority		96,403,000	41,124,000
Nat'l Advisory Comm. for Aeronautics	($11,000,000)	15,500,000	10,000,000
Def. Act PL 583, wind tunnels		75,000,000d	
Fed Power Comm., flood control surveys		351,700	
General Services Administration			
Public Buildings Service			10,000,000
Def. Act, 1949-'50			5,750,000d
Sites & planning		22,000,000	
Adv plan, non-federal public works	($27,000,000)	20,000,000	680,000
Virgin Islands public works	($1,467,000)	1,000,000	
Grants for plan preparation, water pollution control		750,000	
PHS bldgs. & facilities, Cincinnati		1,400,000	
Exec mansion renov & moderniz		3,400,000	1,374,500
Def. Acts 1949-'50			2,274,500d
General Accounting Office Bldg., DC		15,358,194	
Federal Courts Bldg., DC		6,000,000	
Federal Office Bldg., Nashville		1,200,000	
Alaska public works		9,000,000	
District of Columbia PL 616, July	(18,357,500)	17,397,375	14,534,250
Def. Act, 1949-'50			401,175d
Dept. of Defense			
Military establishments			
Army, Corps of Engineers		95,478,000	85,177,044
Def. Act 1949-'50			47,138,000d
Navy, Bu of Yards and Docks		62,928,000	61,876,000
Def. Act 1949-'50			3,500,000d
Air Force		139,784,000	
Def. Act PL 583	(35,000,000)	20,000,000d	
Civil Works			
Rivers & harbors, constr		119,299,050	145,694,290
planning		1,620,000	1,900,000
alter bridges over nav ch		900,000	
Flood control, constr		369,422,240	400,826,300
planning		3,137,200	2,973,000
misc & emergency		2,700,000	2,000,000
Mississippi River & tributaries		66,422,400	
Emergency		450,000	
Sacramento River		2,524,500	
Roseville, Ohio		432,000	
Def. Act PL 583 Lake Okeechobee, Fla.		750,000d	
Emergency fund		2,500,000d	
Misc. civil works		16,000	
Total appropriations	($626,567,500)	$2,672,601,860	$2,055,414,398
Def. Acts		105,055,600	88,765,435
Grand total	($626,567,500)	$2,777,657,460	$2,144,179,833

The $36-billion Federal omnibus Appropriations Act (Public Law 759) provides $2,672,601,860 in outright appropriations for construction, plus another $626,567,500 in contract authorizations. Two earlier appropriations acts also provide construction money, District of Columbia, Public Law 616, $17,397,375 appropriated, and $18,357,500 in contract authorizations, and Deficiency Act, Public Law 583, which provides $105,055,600 in appropriations. This makes a grand total of $2,777,657,460 appropriated this year for fiscal 1950-51, an increase of 29 percent over the $2,144,179,833 appropriated for fiscal 1949-50.

But the omnibus appropriations bill carries a rider requiring $550 million reduction that is expected to cut into the construction funds. An apportionment procedure provided for in the act requires reduction of all appropriations, re-appropriations, and contract authorizations that will not impair national defense. The President and the Bureau of the Budget are now working out these reductions. Reclamation, federal aid to highways and airports expect the heaviest cuts.

A supplemental appropriations bill has passed the House and is in the Senate committee which carries further construction appropriations. These include $84,952,000 for military construction by army engineers, also $2,900,000 for initiating construction of Albeni Falls reservoir, Idaho and $6,000,000 for emergency flood control work. For navy public works, $85,978,000, Atomic Energy Commission, $260,000,000, housing in Panama Canal Zone, $2,500,000 plus $5,358,600 for other departments.

Substantial increases in appropriations are in the omnibus bill for federal aid to airports and hospitals. Compared with last year airport aid gets $37 million this year, $14.5 last year; U. S. Public Health Service gets $100 million this year, $33 million last year. Veterans Administration gets $160 million this year, none last year. Atomic Energy gets $390 million this year compared with $296 a year ago, Tennessee Valley Authority, $96.4 million compared with $41.4 million.

Smaller appropriations include those for Bureau of Reclamation, down $35.7 million, rivers and harbors and flood control construction by Corps of Engineers down $26.4 and $31.4 millions respectively.

In detail by departments or agencies this new construction money is reported in the accompanying table for funds already provided. (The table does not include any funds from the supplemental appropriations bill which cannot be expected to clear Congress before next week at best.)

BIDS AND BIDDERS

(Major project news received after Construction Reports, page 88, went to press.)

Factory—Philip Morris & Co. Ltd., Inc., will construct a $6,000,000 cigarette factory with warehouses in Louisville, Ky. Lockwood Greene Engineers, Inc., New York, N. Y., are architects and engineers.

TV Plant—Television set manufacturing plant for Westinghouse Electric Corp. will be constructed in Metuchen, N. J., by Austin Co., Cleveland, O., for about $4,000,000.

High School—Board of Education, Passaic, N. J., asks bids Sept. 28 for high school on Paulson Ave. to cost approximately $4,400,000.

Department Store—Beverly Hills, Calif., Development Co. awarded contract for 4-story department store to be occupied by J. W. Robinson Co. to William Simpson Construction Co. of Los Angeles. Estimated cost is $4,000,000. Paul E. Jeffers, Los Angeles, is engineer.

Highway & Bridges—S. J. Groves & Sons Co., Johnstown, Pa., was awarded contract for 1.99 miles of 3- and 4-lane highway, a deck plate girder and I-beam bridge and reinforced concrete bridge near Meadville, Pa., at $3,775,560, by the Pennsylvania State Highway Department, Harrisburg.

Factory—International Harvester Co., Chicago, will take bids at once for $3,000,000 factory addition at Melrose Park, Ill.

Steel Plant—Armco Steel Corp., Middletown, Ohio, plans expansion of steel plant in Ashland, Ky., to cost approximately $15,000,000.

Flood Control—Tarrant County Water Control and Improvement District 1, Ft. Worth, Tex., will vote bonds Oct. 27 for flood control improvements. Estimated cost is $7,000,000. Freese & Nichols, Ft. Worth, are consulting engineers.

Sanitary Sewers—East St. Louis, Ill., cancelled bids to have been opened Sept. 1 on sanitary sewer serving city and suburban areas of Lansdowne and Edgemont. Estimated cost was $7,000,000 to $11,000,000. David J. Johnson is city engineer; Horner & Shifrin, St. Louis, Mo., are consulting engineers.

Veterans Hospital—Corps of Engineers awarded contract for 750-bed general medical Veterans Administration hospital in Pittsburgh to John A. Johnson Sons Co., Brooklyn, N. Y., at $12,323,000. Elevator contract went to Houghton Elevator Co., Toledo, O., at $470,000.

Warehouse—Pittsburgh Transfer and Storage Co., Pittsburgh, Pa., plans to construct a $3,000,000 2-story warehouse. Hunting, Larsen Dunnells are architects.

Schools—Board of Education, Tulsa, Okla., will hold election Sept. 26 to vote $4,800,000 bonds for additional schools.

Assembly Plant—Ford Motor Co., Dearborn, Mich., plans to build an assembly plant for Ford cars and trucks on 150-acre tract near Kansas City, Mo. It will cost between $25,000,000 and $30,000,000.

Nylon Plant—E. I. du Pont de Nemours & Co., Wilmington, Dela., will construct a $24,000,000 nylon yarn plant on 635-acre site on Hwy. 11 between Kingston and Gulfton, N. C.

Steel Mill—National Steel Association of Paz de Rio, Colombia, awarded contract to Arthur G. McKee & Co., Cleveland, O. to design, supervise construction and take bids on equipment for steel mill. Estimated cost is $42,000,000.

Housing—Newark, N. J., Housing Authority plans three housing projects totaling $19,500,000. These are 1,080-family housing in 11 buildings in area bounded by W. Springfield Ave., W. Kinney St., Belmont Ave. and 17 Ave. for $8,000,000; 730-family housing in 7 buildings at Ludlow, Maschen and Dayton Sts. & Elizabeth City line for $6,500,000; 630-family housing in 12 buildings at Grafton Ave., Riverside Dr. and McCarter Highway for $5,000,000.

Dam—Upper Thames River Conservation Authority, London, Ont., awarded contract for construction of Fanshaw Dam project near London to Foundation Co. of Ontario, Ltd., London, and Fred J. Mannix & Co. Ltd., Calgary, Alta., for approximately $2,800,000. H. G. Acres & Co., Niagara Falls, Ont., are engineers.

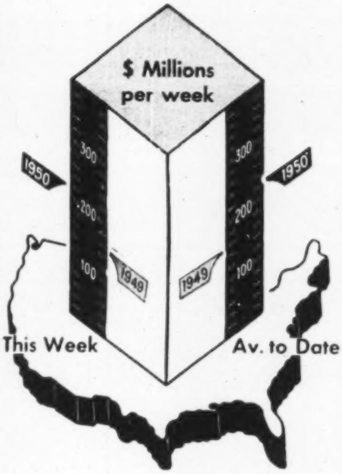
Auditorium—Lincoln, Neb., City Council asks bids Oct. 4 for municipal auditorium to cost approximately $2,375,000.

Plant—Derby Oil Co., Wichita, Kan., asks bids informally on catalytic cracking plant to cost an estimated $2,000,000.

COSTS AND VOLUME

ENR INDEX NUMBERS

Index Base = 100		1913	1926	1949
Constr. Cost	Sept. '50	530.37	254.95	111.18
Bldg. Cost	Sept. '50	392.81	212.34	111.66
Volume	Aug. '50	385	169	135



Activity This Week

As reported to ENR
(in millions of dollars)

Amount of contracts let

	Week of Sept. 14 '50	Cumulative, 37 wks 1950	1949	% chge
Federal	$19.1	$914.3	$790.6	+16
State & Mun.	77.3	2,614.4	2,308.9	+13
Total Public	$96.4	$3,528.7	$3,099.6	+14
Total Private	123.3	4,952.0	2,699.0	+83
U. S. Total	**$219.7**	**$8,480.7**	**$5,798.6**	**+46**

Contracts by type of work

	This Week	Cumulative, 37 wks 1950	1949	% chge
Waterworks	$7.7	$167.6	$156.9	+7
Sewerage	4.7	194.7	190.7	+2
Bridges	9.5	262.8	244.4	+8
Highways	15.7	922.9	689.1	+34
Earthwork, Waterways	2.2	316.7	420.7	—25
Buildings:				
Public	42.5	1,180.9	842.0	+40
Housg., pub.	8.8	206.6	296.4	—30
Housg., priv.	52.3	2,557.3	1,172.8	+118
Commercial	16.6	693.2	409.6	+69
Industrial	42.5	1,015.7	759.3	+34
Unclassified	17.2	962.3	549.7	+75

NOTE: Minimum size projects included are: Waterworks and waterway projects, $28,000; other public works, $50,000; industrial buildings, $68,000; other buildings, $250,000.

New capital for construction

	Cumulative, 37 wks 1950	1949	% chge
NON-FEDERAL,			
Federal Aid	$522.0*	$432.5†	+21
Corporate Securities	1,474.7	1,771.6	—17
State and Mun.:			
Excl. Housing	1,579.8	1,446.8	+9
Housing	520.5	591.6	—12
FEDERAL	2,255.7*	1,711.7†	+32
Total Capital	**$6,352.6**	**$5,954.2**	**+7**

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* Subject to mandatory cuts. † Includes appropriations not passed until Oct., 1949

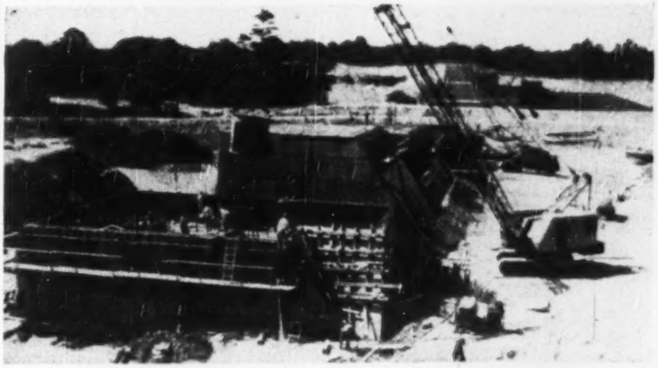
W. G. Hoyt appointed head of new water, power group

In a first step to staff the recently established water and power development arm of the Department of The Interior, Secretary Oscar L. Chapman on Aug. 28 announced the appointment of William Glen Hoyt to head a new division of water and power under Assistant Secretary William E. Warne. Three other appointments were made to the same division: Edward P. Eardley, chief engineer and chief of water and power operations; Reginald C. Price, chief of project review and coordination, and John P. Robertson, executive officer.

The new division takes over the functions previously carried on by two units that now have been abolished, the old power division and the water resources committee. In the administrative setup of the department, the division serves all of Interior's water and power programs.

No plans are afoot to give the division broader jurisdiction when the Interior Department takes over power industry controls under the President's expected executive order, following enactment of the Defense Production Act.

Hoyt has been vice-chairman and executive officer since 1944 of the department's water resources committee. He joined the Geological Survey in 1907 and during the following 37 years filled a number of important positions in the water resources branch and the conservation branch of the USGS.



STRICTLY FOR FLOOD CONTROL—Mansfield Hollow Dam, on the Natchaug River in Connecticut, is a flood-impounding structure behind which normal agricultural pursuits (except farm housing, of course) will take place most of the time. This overflow section is growing at about 450 cu yd of concrete a day, toward a total yardage of 70,000. Project also includes long earth dikes that will provide 16 ft of freeboard above overflow crest. Project is being built by D. V. Frione and Sons, Inc., North Haven, Conn., for the New England Division, U. S. Corps of Engineers.

◆

Garbage grinders in 80% of town's kitchen sinks

Jasper, Ind., the city that passed an ordinance to make itself the world's first to substitute individual garbage grinders for garbage collection (ENR March 2, p 29), now has been operating under the new law for more than a month. Nearly a thousand families, or about 80 percent of the city's 1300 families, have installed disposal devices in their kitchen sinks.

The city ordinance, enacted Feb. 14, went into effect Aug. 1. It outlined sanitation requirements for the storage of garbage, such that it left householders no alternative but to buy disposers, haul away their own garbage each day, or bury it 2 ft deep underground. Garbage collection by the city ended Aug. 1.

The city had made a contract with General Electric Co. to supply and install disposal devices at less than half the regular price—about $75. For a limited time, the unit still may be purchased at the low price, with arrangements available for installment payments.

About one hundred of the city's families have made arrangements for regular garbage removal. This leaves two hundred families who may face prosecution for failure to dispose of garbage properly. The penalty is $25 a day for every day of nuisance-existence.

◆

McNary Dam construction proceeding on schedule

McNary Dam on the Columbia River between Washington and Oregon is now 25 percent complete, the Columbia Basin Inter-Agency Committee reports.

The navigation lock, fishladder and first 13 spillway bays, all on the Washington side, are almost finished, the dam is about one-third completed. Work on the Oregon shore now is about 26 percent complete. This includes the substructure for the first two power units, a station service bay and assembly bay and some embankment, as well as the second step cofferdam.

Work is scheduled to begin next May on the final phase, expected to require about 36 months. One big contract will include completion of the superstructure of the first two power units, the complete powerhouse for the remaining 12 units, the remaining 9 spillway bays, completion of embankment on both sides of the river and completion of the Oregon shore fish passage facilities.

Ohio Turnpike route okayed by commission

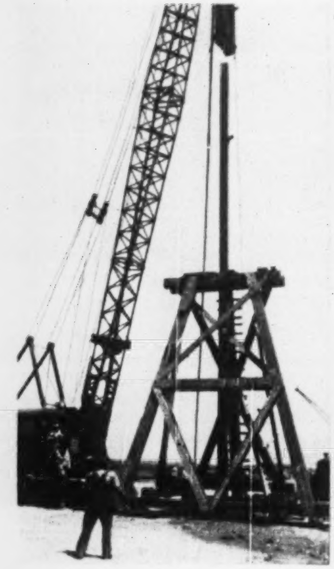
Despite Cleveland efforts to draw the Ohio Turnpike route closer to that city, the Ohio Turnpike Commission has approved a rough location that misses Cleveland by 30 miles. The route was recommended by State Highway Director T. J. Kauer and two engineering firms. Cleveland had proposed an alternate route that would swing the turnpike northward to a point 17½ miles from the city's center.

In making the decision, the commission heeded advice that the alternate route would not produce enough additional revenue to pay for the higher cost—estimated at between $10,300,000 and $15,050,000.

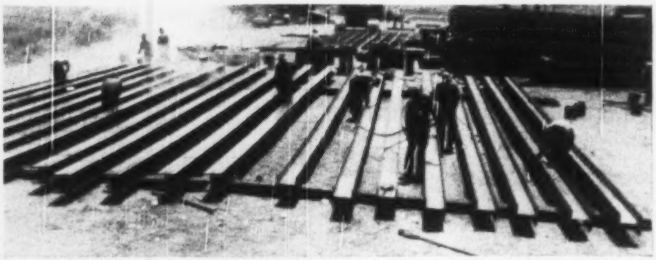
The route approved by the commission is a mile-wide band across the state, running from a connection with the westward extension of the Pennsylvania Turnpike at Petersburg, northwestward past Youngstown, Niles and Warren. The route then goes westward past Akron, then between Cleveland and Medina, between Lorain and Elyria, between Sandusky and Fremont, and on to the Indiana line.

The turnpike will be located within the mile-wide band if further surveys this year show the location to be feasible.

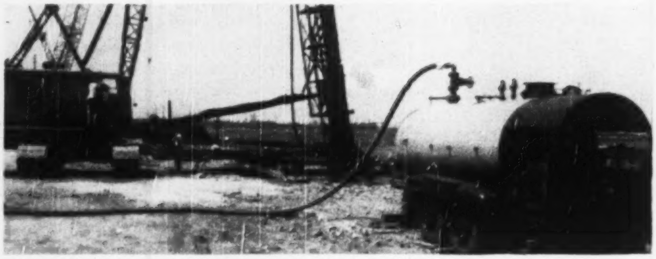
Meanwhile Attorney General Herbert S. Duffy has paved the way for payment of private engineering firms surveying the route for the toll turnpike. He ruled that Highway Director T. J. Kauer can contract with private firms for the survey. The ruling was asked by State Auditor Joseph T. Ferguson.



TIMBER JIG spots test pile driven to determine length of pile needed.



COATED AGAINST CORROSION—Steel H-piles get flame cleaning, hot enamel.



STEAM GENERATOR feeds double-acting hammer about 3,300 lb of steam per hour, has 4,200-lb-per-hr capacity.

New Jersey Turnpike builders exhibit a variety of piledriving techniques

The thin, disjointed strip of real estate that one day will be the New Jersey Turnpike is, at present, a study in piledriving techniques. Contractors are attacking a wide variety of foundation problems and coming up with some interesting solutions.

• **Fill stabilization**—Installation of vertical sand drains is the major piledriving operation on the job—not because the method is new (see ENR July 21, 1949, p 42) but because of the number of drains going in and their record lengths (see cover).

Altogether there will be 70,000 sand drains on the 118-mile length of turnpike; 37,000 of these already have been placed. The average 50 ft in length and range in length from 10 ft to 101 ft—the latter a new record believed to be about the limit to which sand drains are practical as a compaction aid. There are seven contractors driving 14-in. and 20-in. dia sand drains at prices from $0.40 to $1.00—averaging $0.556 per lf.

Vertical sand drains are spaced on from 6 to 12-ft centers and are topped by a horizontal sand blanket of variable thickness. Fill is compacted above this horizontal drain and rate of settlement is recorded as the load builds up. Settlement platform readings determine a basis for payment.

(On the Secaucus Meadows, where borings went down 186 ft without reaching bottom, the contractor is pushing a 10-ft blanket of fill ahead about 300 ft per day. In places this fill has settled back to original grade, but the settlement platforms assure him payment for his efforts.)

Displacement stakes are used to check horizontal and vertical movements of the meadow alongside the fills. Pore pressure gages also set alongside record pressures at various depths along the centerline of fill. These will remain in place for permanent record.

• **For spotting single piles**—At the Passaic River bridge approaches, contractor George M. Brewster & Son, Inc., built the timber jig pictured above for plumbing and guiding test H-piles driven to find pile length for his steel order. This easily-moved timber frame (and a long driving hood extending over the top of pile from the hammer) keeps piles plumb during driving. Between drivings, the crane is free for other hoisting duties at the site.

• **Coating piles**—Steel H-piles for Passaic River bridge south-approach piers are being given a rust-preventative coating by the Railroad Waterproofing Co. prior to driving. For their upper 25 ft or so, the H-beams are flame-cleaned, coated with a cold primer and then covered with a hot enamel. The hot material is poured on from a sprinkling can, with sprinkler removed, as the H-beams are rotated to bring all the surfaces up for coating.

In driving H-piles on the north side of the Passaic River, Brewster is using a steam generator to feed a double-acting hammer in 110-ft leads. This source of steam quickly builds up pressure and can supply 4,200 lb per hour; the hammer is said to use only about 3,300 lb per hour. Steam is generated at 115 psi and reaches the hammer at about 105 psi.

These H-piles are driven in 70-ft lengths; additional lengths are welded on as needed.

Elsewhere on the job, precast concrete piles, batter piles, and soldier piles for excavation are being driven as the pile drivers do their part of the turnpike stabilization and substructure work.

• **Turnpike progress**—The $220 million toll highway is well on its way toward scheduled November, 1951, completion. All grading, drainage, bridge substructures, superstructures, buildings and paving will be under contract this year. Paving Bids will be taken within the next few weeks.

As of last month a total of 47 contracts had been awarded involving nearly $105 million. All but about $2 million worth of these contracts have been awarded this year.

Chicago hospital building is having a boom at the present time

Structures valued at $50,000,000 are going up in three medical districts—Minneapolis also has extensive plans

A hospital construction boom is in progress in Chicago, with structure valued at $50,000,000 going up in three medical districts in the city. The major development is concentrated in the West Side Medical Center, where the federal government, the state, the county and the University of Illinois are erecting buildings.

The West Side phase is the beginning of a five-year program. The area, a blighted neighborhood, already has 22 established medical institutions on 94 acres. Purchase of 106 additional acres has been authorized by the state.

The state has granted $4,000,000 for land acquisition and plans to provide $12,000,000 more.

The steel structure for the $10,000,000, 15-story Veterans Administration hospital is now being erected in the center. VA is also seeking approval of Congress for construction of an eight-story, $3,500,000 office building adjacent to the hospital.

A 14-story, 411-bed teaching hospital is being added to the University of Illinois Research and Education Hospitals at a cost of $5,368,628. The addition is T-shaped, with a tower 150 ft wide and 130 ft deep.

Construction is about to begin on the $6,000,000 Medical Center Steam Plant and distribution system to serve the University of Illinois and a half dozen other institutions, including the VA hospital.

Designed by Stone and Webster Engineering Corp., Boston, the building will be 80 ft wide, 124 ft long and 76 ft high. It will have three 90,000-lb per hour boilers with auxiliaries. The plant will be equipped with mechanical dust collectors to prevent fly ash from spreading.

In the finishing stage is the 15-story, 340-room internes' dormitory and doctors' residence erected by Cook County at a cost of $2,800,000.

The State Department of Public Health is erecting a tuberculosis hospital of 483 beds. This unit will be eight stories high and will cost $3,498,000.

• **Other plans**—Other buildings included in the five-year program are:

Loyola University Medical and Dental Schools for 800 students, $7,000,000; an Institution for Tuberculosis Research for which the legislature has appropriated $350,000; University of Illinois College of Pharmacy for 600 students and expansion of its General Hospital, 350 beds; Presbyterian Hospital expansion, 200 beds, and relocation of its nurses' residence at a cost of $4,500,000; and relocation of the Cook County Graduate School of Medicine and the Medical Center Y.M.C.A. The State Department of Public Welfare hospital for the psychiatric treatment of children, 50 beds, $580,000.

In May ground was broken for the $14,000,000 VA research hospital in the Northwestern University Medical Center on the near North Side. This 17-story structure will have 529 beds.

On the South Side, the University of Chicago medical center, has three new buildings. The Nathan Goldblatt Memorial Hospital has just been dedicated. In June ground was broken for the Argonne Cancer Research Hospital, described as the first in the world to be designed exclusively for cancer research and treatment. It will have six floors and accommodations for 50 beds. The cost of $3,500,000 is financed by the Atomic Energy Commission.

Minneapolis 20-year plan—In Minneapolis, Minn., a master plan for hospitals in that city and Hennepin County for the next 20 years has just been completed.

Using 1955 as an immediate goal, the plan calls for $19,916,000 worth of construction and remodeling during the next five years. An additional $17,800,000 worth of construction work would be under way between 1955 and 1970 to provide facilities for an estimated county population of 778,000 at that time. Population of the county today is 669,444.

Integration and centralization of hospital services as recommended in the plan could mean a saving of $1,222,500 a year in hospital operations, it is claimed.

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Philadelphia is pushing its Market St. subway

Philadelphia, anxious to get all phases of its $33,000,000 Market St. subway extension project under contract before the international situation might endanger the availability of materials, is taking bids for construction of the $3,000,000 westernmost section in West Philadelphia.

The new section of tube will run from 42nd St. to 46th St. The city also hopes to start work this fall on three blocks of new tunnel that will connect the present subway with an existing but unused tube that runs underneath the Schuylkill River to 32nd St.

Construction of the tube from 32nd St. to 36th St. is 99% finished; work is 91% finished from 36th St. to 42nd St. This work does not include rails or other equipment, however. The city expects to put the new subway into operation by the middle of 1952. At present, trains operate on elevated lines west of 21st St.

NEW HOSPITAL—This 250-bed Veterans' Administration hospital was recently finished in Fresno, Calif., under a $5,600,000 contract by the James I. Barnes Construction Co., San Francisco. The reinforced concrete and steel project was built under the direction of the Corps of Engineers. The building is 100% air conditioned and is designed to resist earthquake stresses, (ENR, March 3, 1949, p 58). The architect-engineer contract for design was held by Masten & Hurd, architects, and Huber & Knapik, engineers, both of San Francisco.

Engineering–Profession or Trade?

• Recent decisions of the U. S. Supreme Court in the case of real estate boards, and of lower courts on professional matters, have direct bearing on the civil engineering field. Here is a summary of those decisions and an analysis of their meaning that is of primary importance to every engineer.

New light is cast on the old question as to whether engineering is a profession or trade by the U. S. Supreme Court's decision in a case relating to fee schedules set up by real estate boards.

Because real estate operators—like engineers—sell services rather than commodities, the first question before the court was whether supplying such services constituted a trade, as that term is used in the prohibitions against restraints on trade in the Sherman Act.

The Supreme Court concluded that it did constitute a trade. And in stating why it did, the court made observations that may be applicable to engineering services.

This decision of the Supreme Court also is of importance to engineers because it related to schedules of minimum fees that are set up by local real estate boards and which members are required to observe. The court found that the system under which the Washington Real Estate Board issued its schedule constituted a violation of the Sherman Act.

Since the high court handed down its decision (May 8) the U. S. Department of Justice has announced that the decision will be used as the basis for action against organizations of architects and engineers that set up schedules of fees. The charge will be that the use of these schedules is also a violation of the Sherman Act (ENR May 18, p 23).

From a review of this decision and of preceding legal dictum, it appeared logical to conclude that, from the purely legal point of view, only a small part of what engineers do falls into the professional classification. When a consulting engineer is called in for the sole purpose of rendering an opinion based on his knowledge of engineering, the courts could be expected to hold that his work on that engagement is professional. But as soon as he undertakes to render a service, to prepare designs and specifications, his work would be considered a trade—in the eyes of the law.

The Supreme Court had before it an appeal from a decision of the United States District Court for the District of Columbia in The United States of America v The National Association of Real Estate Boards et al. In the district court, the Department of Justice had charged the National Association of Real Estate Boards, its executive vice president, the Washington Real Estate Board and 15 of its members with violation of the Sherman Act by conspiring to fix commission rates for their members. (The national association had in its code of ethics a provision that schedules of fees set by local boards should be observed, and the Washington board had a provision in its code stating that "brokers should maintain the standard rates of commissions adopted by the board, and no business should be solicited at lower rates.")

The national and local boards as well as the officers and members covered by the indictment were acquitted by the district court in both the criminal and civil action. Subsequently, the Department of Justice appealed the district court's decision in the civil suit to the Supreme Court. The high court concluded that there was not sufficient evidence against the national board and its executive officer to warrant conviction, so it let their acquittal stand; it concluded, however, that the case against the Washington board was sufficient to warrant conviction.

• Definition of a "trade"—A basic question in this case was whether the business of a real estate agent is a "trade" within the meaning of the Sherman Act, or whether it is a type of service that is outside the provisions of that act.

On that point Justice Douglas, who delivered the opinion for the Supreme Court, said:

> **"Members of the Washington board are entrepreneurs. Some are individual proprietors; others are banks or corporations. Some have no employees; others have large staffs. But each is in a business of his own. The fact that the business involves the sale of personal services rather than commodities does not take it out of the category of 'trade' within the meaning of Sect. 3 of the act. The act was aimed at combinations organized and directed to control the market by suppression of competition 'in the marketing of goods and services.'"**

Justice Douglas went on to quote from an earlier opinion of the Supreme Court in which Justice Story said, in part: "Whenever any occupation, employment or business is carried on for the purpose of profit, or gain, or a livelihood, not in the liberal arts or in the learned professions, it is constantly called a trade." It is in that broad sense, said Justice Douglas, that "trade" is used in the Sherman Act. "That has been the consistent holding of the decisions. The fixing of prices and other unreasonable restraints have been consistently condemned in case of services as well as goods", he added.

Justice Douglas then cited cases to indicate the wide range of business activities that had been held to be covered by the act. In this connection he said:

> **"Chief Justice Groner made an extended analysis and summary of the problem in United States v American Medical Assn. where the Court of Appeals for the District of Columbia held that the practice of medicine in the district was a 'trade' within the meaning of Sect. 3 of the act. Its conclusion was that the term included 'all occupations in which men are en-**

gaged for a livelihood.' We do not intimate an opinion on the correctness of the application of the term to the professions. We have said enough to indicate we would be contracting the scope of the concept of 'trade.' as used in the phrase 'restraint of trade,' in a precedent-breaking manner if we carved out an exemption for real estate brokers. Their activity is commercial and carried on for profit."

• Application to engineering—The Supreme Court's statement that members of the Washington real estate board are entrepreneurs, each with a business of his own, and its observation that "the fact that this business involves the sale of personal services rather than commodities does not take it out of the category of 'trade' within the meaning of the act" would seem to indicate that the court would reach a similar conclusion concerning the practice of consulting engineers and architects, if and when the question is placed before it.

However, what it said in that same decision concerning Justice Groner's discussion of the practice of medicine indicates that the court is not inclined to exclude or include any group simply because its members may be engaged in what is generally classified as the liberal arts or professional work. The decision will be based on whether the particular operation that is indicted as being a restraint or trade is a "restraint" as that term is commonly used and is applied to a "trade" as that term is used in the Sherman Act.

• Professions not exempted—A proper evaluation of the Supreme Court's statement concerning Justice Groner's discussion of the practice of medicine requires the background of an understanding of how Justice Story's exclusion of the learned professions from the "trade" classification came to be used in the case against the physicians, and of what Justice Groner said about that exclusion.

Justice Story made his statement in a case in which question had been raised as to whether certain operations of the steamship *Nymph* constituted "trade". No persons engaged in the liberal arts or the learned professions were involved. But subsequently, in the case of the Atlantic Cleaners and Dyers v The United States Justice Sutherland, who delivered the opinion of the Supreme Court, quoted Justice Story's opinion to support the court's conclusion that the cleaners were engaged in a trade as that term is generally understood.

When the Department of Justice started action against the American Medical Association and the Medical Society of the District of Columbia charging them with conspiring to destroy the business of the Group Health Association by threatening disciplinary action against physicians serving the association and by denying the physicians access to certain hospitals in the district, lawyers defending the physicians seized upon Justice Story's statement as evidence that members of the learned professions were exempted from the provisions of the Sherman Act. In their briefs they italicized the words "*not in the liberal arts or in the learned professions.*" They succeeded in convincing the trial judge that Justice Sutherland's use of that phrase (in his quotation of Justice Story's definition of what constituted a trade) made it the official opinion of the Supreme Court, and that, therefore, the practice of medicine was not a trade as that term is used in the Sherman Act.

But when the case was taken to the District Court, Chief Justice Groner, in his opinion finding that the American Medical Association and others had violated the Sherman Act, attached no such significance to Justice Sutherland's inclusion of that phrase in his opinion. He said:

"The learned trial judge felt that the italicized words should be regarded as an authorative statement of the Supreme Court that the professions were not trades and therefore not within the intent of the act. But we think this by no means follows. The court had before it only the problem of whether 'trade' was broad enough to include the cleaning and dyeing of clothes, and held it was. To reinforce its reasoning, the court quoted language which happened to exclude the learned professions, but the limitation was not responsive to the question at hand and was purely casual, and in the circumstances ought not, we think, to be regarded as a proper guide in deciding the important question in this case."

It was against this background that the Supreme Court, in the real-estate board case, followed its citation of Justice Groner's finding that the practice of medicine was a trade within the meaning of the Sherman Act with its statement: "We do not intimate an opinion on the correctness of the application of the term to the professions." The Supreme Court may not even agree with Justice Groner's conclusion that the practice of medicine is a trade; yet, conversely, it appears to desire to make certain that Justice Story's statement is not again taken as providing blanket exemption for the liberal arts or professions.

Use of Fee Schedules by Engineers

The U. S. Supreme Court's findings in the case against the National Association of Real Estate Boards also is of importance to engineers and architects because of the Justice Department's announced plan to use it against them, as noted previously.

For many years the American Society of Civil Engineers, the American Institute of Consulting Engineers and the American Institute of Architects have issued minimum fee schedules. Their use of such fees, however, has differed materially from the use of fee schedules by real estate boards in that their codes of ethics do not require adherence to the schedules in fixing the fee for a particular engagement.

An exception to this general rule is found in the practice of a few of the more recently organized state societies of professional engineers. The Pennsylvania Society of Professional Engineers, for example, has issued a schedule of minimum engineering fees that concludes with the following statement: "Non-compliance with the terms of this schedule will be considered an unethical practice."

No attempt to enforce the use of any of these fee schedules is on record, but clear evidence of enforcement is not essential to a conviction for violation of the Sherman Act, as will be seen by the second paragraph of the quotation from the Supreme Court's decision in the real estate board case that is given below. "Subtle influences," the court said, "may be just as effective as the use of formal sanctions." On the other hand, what the court said later in the same decision indicates with equal clarity that it will not confirm a conviction unless there is convincing evidence that a fee schedule is used to fix the price on engineering or architectural services.

Commenting on the standard rates of commissions set in the code of the Washington Real Estate Board, Justice Douglas, speaking for the Supreme Court, said:

"Members agree to abide by this code. The prescribed rates are used in the great majority of transactions, although in exceptional situations a lower charge is made. But departure from the prescribed rates has not caused the Washington board to invoke any sanctions. Hence the District Court called the rate schedules 'non-mandatory.' "

"Enough has been said to show that under our decisions an illegal price-fixing scheme has been proved, unless the fixing of real estate commissions is not included in the prohibitions of Sect. 3 of the act. Price-fixing is per se an unreasonable restraint of trade. It is not for the courts to determine whether in particular settings price-fixing serves an honorable or worthy end. An agreement, shown either by adherence to a price schedule or by proof of consensual action fixing the uniform or minimum price, is itself illegal under the Sherman act, no matter what end it was designed to serve. That is the teaching of an unbroken line of decisions. . . . And the fact that no penalties are imposed for deviations from the price schedules is not material. . . . Subtle influences may be just as effective as the threat or use of formal sanctions to hold people in line."

From the evidence before it the Supreme Court concluded that in the instance of the Washington Real Estate Board the "subtle influences" had been used to keep members from charging fees below those set in the board's fee schedule. Therefore, it reversed the district court's acquittal of that board in the civil suit.

The court, however, could find no such clear evidence of price fixing on the part of the National Association of Real Estate Boards. Concerning that association Justice Douglas said:

"The national association is a nation-wide, incorporated trade association of which the Washington board is a member. Active members of the Washington board are also members of the national association. The national association has a code of ethics which includes an article stating that 'the schedules of fees established by the various real estate boards are believed to represent fair compensation for services rendered in their communities and should be observed by every realtor.' It is provided in the by-laws of the national association (1) that each member board shall adopt the code of ethics of the national association as a part of its rules and regulations for violation of which disciplinary action may be taken, and (2) that any member board that neglects or refuses to maintain and enforce the code of ethics with respect to the activities of its constituent members may be expelled from membership in the national association.

"The statement in the code of ethics that the schedule of fees 'should be observed' is somewhat ambiguous. It may be advisory only. The provision of the by-laws that violations of the code of ethics of the national association should be the basis of disciplinary action against both member boards and their constituent members is aimed at 35 articles of the code of ethics, not selectively at the fee provision. So we are left somewhat in doubt as to the extent if any to which the national association and Nelson [the executive vice-president] were architects of the fee-fixing conspiracy or participants in it. At best their relationship to it is on this record a somewhat attenuated one.

'It is not enough that we might give the facts another construction, resolve the ambiguities differently, and find a more sinister cast to actions which the district court apparently deemed innocent. . . . We are not given those choices, because our mandate is not to set aside findings of facts 'unless clearly erroneous.' "

As the court was not convinced that the action of the district court was clearly erroneous in acquitting the national association, it let the acquittal stand.

Against this background it appears highly improbably that the Department of Justice will be able to build up a case having any substance against such organizations as the American Society of Civil Engineers or the American Institute of Architects. That certainly would be true of an attack on the ASCE because its new fee schedule is a median schedule, not a minimum.

As for the state professional societies with definite requirements that a fee below the schedule must not be charged, the chance that the Justice Department will single out one of those societies for attack seems remote.

Notes on Legal Decisions

Summaries of decisions relating to construction prepared by I. Vernon Werbin, counselor at law and engineer, New York, author of Legal Phases of Construction Contracts (McGraw-Hill)

Intent of Contract Clauses

Specifications for a housing project provided that the top soil over the areas to be occupied by any buildings, streets, and other named areas, should be removed to an average depth of six inches and stacked on the site of the work. The contract contained no other limitation as to the amount of top soil to be removed.

After the subcontractor had removed all the top soil as required by the specifications, the general contractor refused payment for the full amount of top soil so removed, contending that payment should be limited to the amount of top soil needed to do the necessary landscape work, as this was the sole purpose to which the top soil was to be put.

In support of this contention general contractor relied on a line of cases which hold that where a contract states an approximate amount of materials to be supplied but it appears that the real intent of the parties is that the actual need is the true measurement intended, recovery is to be based on the amount actually needed. Thus in one case,[2] it was held that a contract for the sale and purchase of approximately 225,000 barrels of cement which was to be used in connection with the construction of a certain project, was a contract for the purchase of the amount of cement needed to construct the project in question, so long as the purchaser acts in good faith.

The court held, however, that as the contract required the subcontractor to remove all the subsoil on the site of the work to a depth of six inches without any limitation, he was entitled to recover payment for all the top soil so removed, irrespective of the amount needed to do the necessary landscape work.[1]

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(1) Dyker Bldg. Co. v United States et al., 182 F. 2d 85 (U. S. District Court of Appeals, Washington, D. C., Jan. 6, 1950.)

(2) Maryland Dredging & Contracting Co. v Coplay Cement Mfg. Co., 265 Fed. 842.

Limits on a Guaranty

A clause in the specifications for the foundation of a building, drawn by the architect and made part of the contract, stating that "the whole to be made perfectly watertight and guaranteed," did not constitute a guaranty by the contractor that the cellar should be watertight, where the specifications prescribed in detail the manner of construction and the materials to be used. That was a guaranty only of his compliance with the specifications, and of the effectiveness of his work in matters about which he had a discretion.[1]

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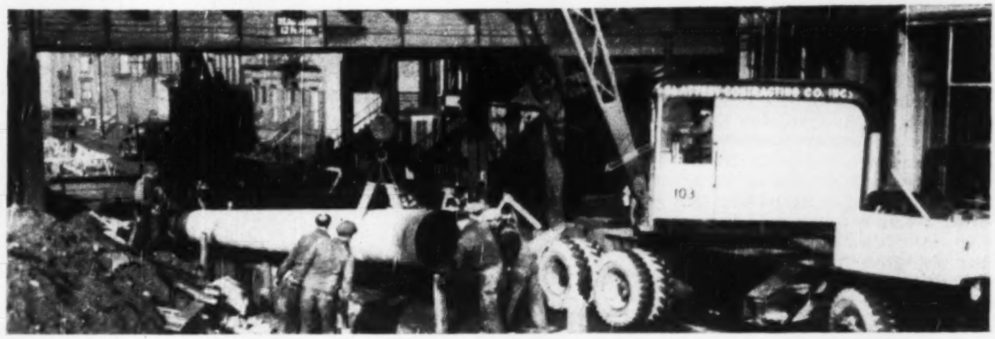
(1) Bush v Jones, 144 F. 942 and cases there cited.



New York's high-pressure natural-gas distribution line can be called . . .

The "Safest Inch"

Extraordinary anti-failure precautions are dictated by location in densely populated areas as well as in ground already interlaced by vital utilities.

Martin Toscan Bennet
Consulting Engineer
Washington, D. C.

SINCE the construction of the "Big Inch" oil line during World War II, the same type of name has been applied to a number of other lines. For example, a 34-in. Texas-supplied gas line in Southern California is called the "Super Inch" line. Last year the Seaboard Natural Gas Co. built a 26-in. line across rough terrain from Charleston, W. Va., to Rockville, Md. This became known as the "Toughest Inch" line.

Following this trend, a new natural-gas pipeline in metropolitan New York should be called the "Safest Inch." Since no reasonable expense has been spared in order to achieve safety, the line also might be called the "Costliest Inch." By late fall this year natural gas will be brought to this New York distributing system by the Transcontinental Gas Pipe Line Corp., which now is laying pipe from southern Texas to the east side of the Hudson River.

The metropolitan high-pressure natural gas system will start with 30-in. diameter pipe but will decrease in diameter as it extends to the various plants (see map). Total cost is expected to reach $14,000,000; total length is 262,830 ft.

The gas line is designed for a working pressure of 350 psi, although it will be used at only a fraction of this pressure initially.

• Public safety most important—Bringing a high pressure gas line of this size into a concentrated urban area does not have many precedents. Because of the peculiar location, layout, and size of the city of New York, it was necessary to route the line through densely populated sections. This raised many questions of public safety, which have been answered by utilizing every precaution.

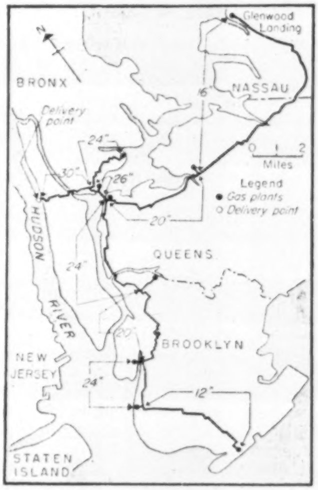
No standard specifications are available for a complete high pressure pipeline system such as the New York line, but wherever possible, standard ASTM, ASA, and similar specifications were used.

A large amount of experience on urban distribution systems has been acquired by the companies handling gas in the metropolitan area, but this experience has been gained mostly with relatively low pressures. Cross-country pipeline experience has been available also, but this experience had to be adapted to suit the more difficult and stringent requirements of the urban area.

Five companies each agreed to build the section of the line that ran through that company's franchise territory. Arrangements were made for assessing fixed charges, maintenance, and operating expenses where a given section of line was in effect used by more than one company. The portion of the Consolidated Edison Co.'s line in Manhattan, for example, carries gas for all five companies, so all companies assumed portions of the expense.

• Companies standardize methods—In order to effect a proper division of responsibility and to preserve adequate cooperation, the five companies joined in a so-called New York Facilities Agreement.

Engineering talents of all companies were combined in preparation of specifications common to the work of all, and in arriving at an agreement on the design and the basis for determining pipe size. Specifications for materials, for methods of installation, testing, control, and metering all were set up in standard form, which represents the combined experience and engineer-



FIVE GAS COMPANIES share in the construction of this system, which will take delivery at a point on The New York side of the Hudson River.

ing judgment of the five companies. All of the companies, except one that does not operate within the city limits of New York, submitted detailed plans and specifications for review by city authorities in connection with the applications for permits to install individual runs of main.

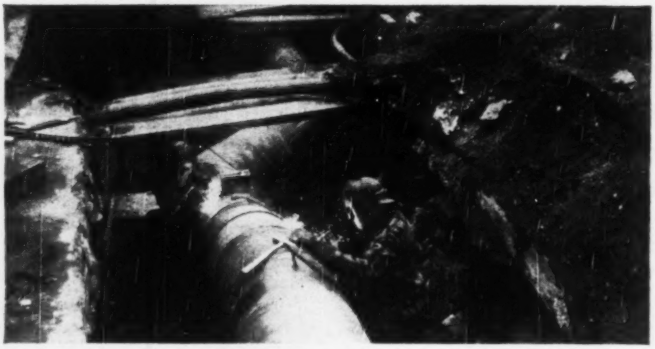
• The city's responsibility—The City of New York has a multiple responsibility for this gas line. Not only must the city protect various city-owned facilities, such as subways, sewers, bridges, tunnels, wharfage, water mains, and streets, but also it must care for the public safety. The administration of the approval for the gas line is in the hands of Stephen J. Carney, Commissioner of Water Supply, Gas and Electricity. Detailed administration of the issuance of permits and inspection work is in the hands of Nicholas J. Kelley, chief engineer of Light and Power.

• Plans cleared through consultant—In order to facilitate approval of the plans and specifications, a procedure was set up whereby each company submitted its plans to a consultant engaged by the city. He reviewed them with the company's engineers in order to assure incorporation of all feasible safety measures. Approval by the various commisisons, authorities, and other organizations responsible for city facilities followed this review.

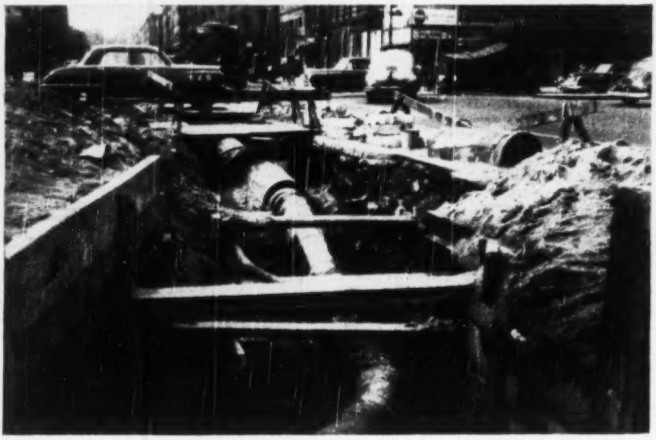
• Design-safety provisions—Conservative design calculations were used throughout. The allowable stress in the pipe used is little more than half that allowed by the ASTM standard for pressure piping, in order to take care of traffic loading and shock. Mitred welds are prohibited for bends in excess of 12 deg: sharper bends, tees, and reducers must be forgings. Where traffic loads are unusually heavy, increased wall thicknesses are specified. Where the cover over the main is less than three feet, half-pipe of larger diameter is placed six inches above the main to serve as a protection and a warning should someone some day let a paving breaker slide deeply into the soil.

A number of unusual problems were faced. The most difficult, of course, were those resulting from conflicting underground structures. Many alternative routes were considered so that in only a few instances was it necessary to conduct substantial relocations of interfering underground structures. However, interfering structures often forced the gas main into a location where special precautions had to be taken to protect the main.

As a general rule, the main was covered with a vented casing whenever it crossed over a rapid-transit subway structure. In many cases, the casing had to be of sufficient strength to support the pavement in order to avoid placing the traffic load directly on the gas main.



PIPELINER'S NIGHTMARE—Pipe must thread through maze of existing facilities, so there's little straight work to enable steady progress.

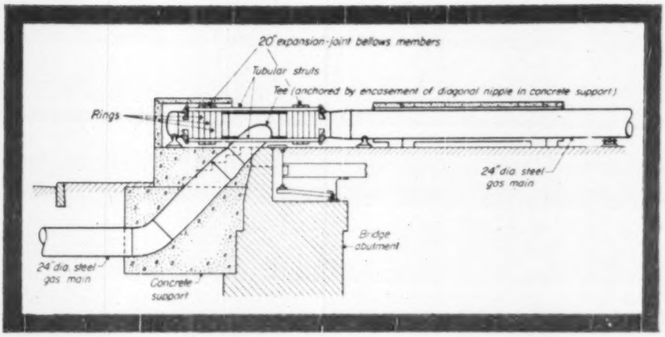


HALF PIPE of larger diameter is placed 6-in. over pressure pipe where pipe is forced closer than 30-in. from surface.

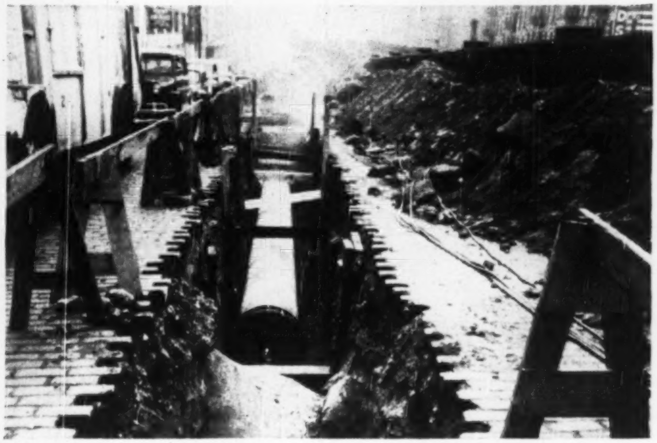
• Expansion joint for bridges—Two bridge crossings have raised special problems because of thermal expansion and bridge movement. In the case of the longer bridge, the pipe will be anchored at the center pier and expansion joints will be installed at each end. In the case of the shorter bridge, the pipe will be anchored at one end and a single expansion joint used at the other end of the bridge. The pipe will be on guides and rollers in order to avoid taking up bridge movement and to transfer pipe movement to the joints.

Because little space was available for the joints, a compact type was developed (see illustration). Probably the first application of its kind, this joint consists of two bellows-type flexible members—each a corrugated, stainless steel bellows tube that is confined within three adjacent Meehanite rings. The rings direct expansion by bearing on the corrugations' inner dimension. Since the rated gas pressure creates a thrust of 55 tons, the two members are required and four heavy tubular struts tie them together so that the tendency of the gas pressure to expand one will be overcome by the tendency to expand the other in the opposite direction. The struts also guide the rings.

• Automatic valves not practicable—Considerable study was devoted to possibilities of using automatic or remote-control valves in the event of an emergency such as a pipeline break. However, no design has been found that is believed to be satisfactory. The present plan is to use manually-controlled valves in the streets. These valves will be operated by truck-mounted power units. Lubricated plug-type valves will be used in order to insure continued operability of valves.


20" expansion-joint bellows members
Tubular struts
Tee (anchored by encasement of diagonal nipple in concrete support)
Rings
24" dia. steel gas main
Bridge abutment
24" dia. steel gas main
Concrete support

SPECIAL EXPANSION JOINT for bridge crossing. Tee-joint remains stationary while two bellows elements, tied by struts, mutually expand and contract.



STRINGENT INSPECTION includes 425-psi compressed-air test on bulkheaded lengths (above). Carbon tetrachloride mixed with the air can be detected to locate leaks.

Procedures have been worked out whereby in the event of an emergency the gas will be shut off at the upstream side of the trouble and the downstream side will be blown down into gas holders at the nearer gas plants. Shut-off valves are specified for strategic locations along the main. About a hundred valves will be used in the entire system.

Submerged river crossings will be made with extra-heavy pipe, on which a special waterproof coating will be applied, followed by a 2½ to 3½-in. layer of pneumatically-placed concrete for weight.

• **Anti-corrosion measures**—Continued safety is assured by precautions against corrosion. Before laying, the pipe is primed with a bituminous paint and then is coated with (a) $\frac{3}{16}$-in. of bituminous enamel, (b) fiberglass wrapping (c) a second layer, $\frac{3}{32}$-in. of bituminous enamel, and (d) asbestos-felt wrapping. In addition to this, one company has wrapped the pipe with a heavy impregnated fiberboard ¼-in. thick. The board is held in place with conventional baling straps. The primary purpose of the outer wrapping is to prevent damage to the bituminous coating during the backfilling operation.

The joints in the pipe, of course, have to be covered after the pipe is welded in the trench. The entire coating is tested at 12,000 to 15,000 volts with an annular-type holiday detector. Holidays (flaws in coating) are patched. Backfill material within 12-in. of the pipe must have a pH value greater than 5.5. Insulating joints are installed at intervals from 1500 to 3500 ft., depending upon soil conditions and likelihood of encountering stray electric currents. After backfilling, the electrical resistance of the coating is tested; resistance is expected to exceed 0.5 megohms per sf of pipe surface. In addition to all this, magnesium anodes in varying numbers are attached to each pipe section between insulating joints. Provisions is made for periodic testing of insulating-joint resistance, of coating resistance and of the electrical potential between the anodes and the main pipe.

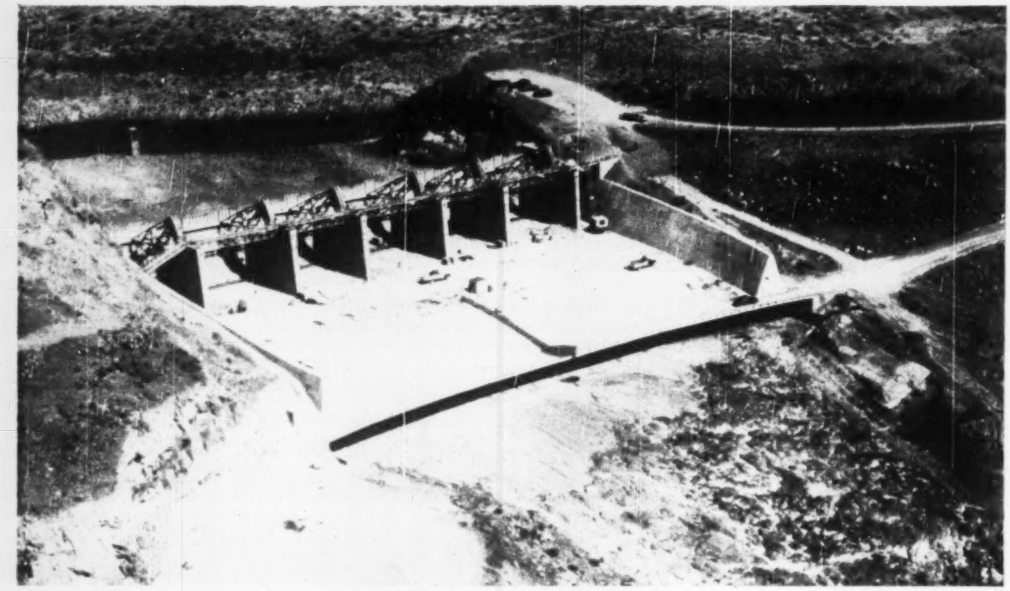
• **Testing procedures are extensive**—Laboratory tests are made upon samples of materials as received. Welders must meet qualification tests in accordance with ASA standards before they are allowed to work on the installation. In order to maintain alertness on the part of the welders and the welding inspectors, occasional welds are removed from the main and subjected to standard test procedures. After a section of main is installed and backfilled, it is subjected to a compressed-air test at 425 psi. Carbon tetrachloride in a concentration of 50 ppm is introduced into the air. Bar holes are driven at all joints and tests are made with a halogen detector sensitive to much less than 1 ppm of carbon tetrachloride.

As a final overall test, pressure-drop measurements are made on the gas main over a period of several weeks. In order to compensate for variations in ground temperature, a reference tank is used. After being filled with air from the main, the reference tank is connected to the gas main through a "U" gauge, which detects any slight differential in pressure between the reference tank and the gas main. A continuous falling pressure over any period of time is not tolerated.

• **Preparation for operation** — Before the gas will be admitted to the main, all air will be purged from it by introducing an inert gas consisting almost entirely of nitrogen and carbon dioxide. This, of course, is to prevent any chance of forming an explosive mixture that might become ignited should a stone or other hard object moved by the gas stream strike a spark inside the main. As a final overall precaution, the gas will contain an odorant so that characteristic odor will be observable if a leak occurs anywhere.

Continuous inspection is maintained over all phases of the construction, not merely to ensure safe construction practices but to assure compliance with approved plans and specifications. The gas companies maintain a specialized staff of inspectors including welding experts. The various municipal departments are constantly on the watch over their structures and in addition, the Department of Water Supply, Gas and Electricity maintains constant surveilance over compliance with the approved plans and specifications.

The author is serving the City of New York as consultant on this work.



THREE RADIAL GATES 114x26-ft at Horseshoe Dam operate as a single unit. Novel location of supporting piers—behind the gates and within the span of the gates—aids spillway operation. Piers accommodate operating mechanism and counterweight wells.

Biggest Radial Gates Work Automatically

INSTALLATION of the world's largest radial gates has just been completed. They are three 114 x 26-ft units at Horseshoe Dam, 50 miles from Phoenix, Ariz., and are significant for other reasons than mere size.

Specifically, supporting piers are located in back of and within the span of each gate. This achieves an important improvement in spillway hydraulic characteristics as compared with end-supported gates. It also permits the gates to be continuous across the ogee spillway crest. In effect, the result is a single gate 342 ft wide, since automatic control makes the three gates operate simultaneously.

Good hydraulic characteristics are important at Horseshoe because the U. S. Bureau of Reclamation requires that the spillway be able to pass a flood flow from the reservoir of 250,000 cfs. Had a more-or-less conventional Tainter gate arrangement been used (comprising, for a channel width of 340 ft, probably six gates, each 50 ft long, set between piers extending upstream of the gate faces), the effective waterway would have been constricted. Result would have been a relatively expensive addition to the height of the dam.

Besides this, the usual method of counterbalancing such gates, by placing tail weights at the ends of arms downstream from hinged supports, would have been out of the question. That's because the balance weights could not be kept clear of the water surface at times of maximum discharge.

• Additional Phoenix water—The gates are being installed largely at the expense of the city of Phoenix to provide upstream storage for municipal water. Actual diversion is some miles down the Verde River.

Horseshoe Dam is one of the works of the Salt River Federal Reclamation Project. The storage works are operated by the Salt River Project Agricultural Improvement and Power District pursuant to contracts between the district's agent (Salt River Valley Water Users Assn.) and the federal government.

Uses of the Horseshoe Dam storage space and of the waters of the Verde River are governed by a number of agreements. In particular, the contract authorizing installation of the spillway gates is an agreement between the association, the city of Phoenix and the United States.

The essential requirement of this contract was that the storage capacity of the reservoir be increased by 75,000 acre-ft over the initial capacity of 67,000 acre-ft. This meant that the full reservoir level must be raised 33 ft above the spillway crest as initially constructed. The answer was an ogee spillway crest section 7 ft higher than the original spillway, and adding the 26-ft high gates. Some minor raising of the earth-and-rock-fill dam was also required. However, this was minimized by ample freeboard allowed when the dam was originally constructed several years ago.

• In-span support—The development of the in-span support was based on these factors: (1) Restriction of the hydraulic capacity would require considerable additional height of fill on the dam and (2) increasing costs of construction limited available funds. These led the designers to the conception that the critical hydraulic section could be moved upstream and the effective area of the spillway increased if the gate faces were located upstream from the piers and made channel. Rubber seals make water-continuous with each other across the tight the joints between the radial gates as well as those between the gates and the spillway walls and bottom.

Each gate is supported by trunnions mounted on a pair of piers located about one-fifth the gate span from the ends of the gate. Bascule weights designed to counterbalance the gates are mounted on the downstream ends of the gate arms and descend into wells in the piers as the gates open. The resultant forces acting on each gate arm (including water loads) are in a plane substantially normal to the gate face and in the plane of the pier. The center of gravity of each bascule weight lies in this same pier plane.

In brief, the Horseshoe Dam gates are designed so that the resultant of all water loads and of gravity loads transmitted to the hinge support is substantially in a plane through the center of the hinge support, normal to it and normal to the gate face.

• **Automatic operation**—Gate operation is controlled automatically by the level of the water in the reservoir. When necessary, however, the gates may be mechanically operated by means of electric hoists. Further, each gate may be operated separately, although normally all three gates will move together.

When the operating wells in the pier are dry, the counterweights (as contrasted with the bascule weights) act to hold the gates in a closed position. As water rises in the reservoir, it is admitted to the counterweight wells, thus reducing the effective weight of the counterweights. The radial gates will be raised and lowered automatically by varying this effective weight so as to balance the moments of the dead loads and the hydrostatic forces on the gate faces.

Water from the reservoir will enter the intake tower of the control system located at the upstream end of the spillway channel. This water flows through a 24-in. feeder pipe to risers in each pier and fills float chambers to the same level as the reservoir. The outlet from each float chamber into the companion counterweight well is controlled by a needle-type valve consisting of an outer shell and suspended plug supported from a differential pulley sheave. To open the valve, the plug is lowered from the opening.

As the reservoir continues to rise, water admitted through this valve into the counterweight chambers will rise, increasing the depth of submergence of the counterweights and reducing their effective weight. (Each pair of counterweight chambers is interconnected by an 18-in. dia pipe to prevent unequal water levels in counterweight wells for each gate.

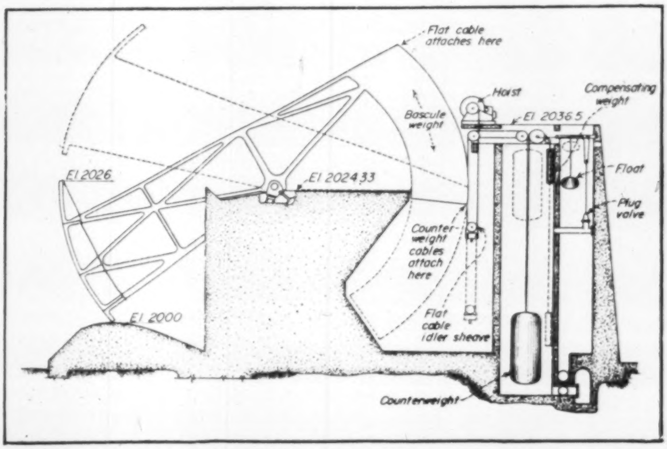
Whenever the closing force and seal friction are overcome by the reduction in effective weight of the counterweights, the gate will open. By varying the inflow of water to the counterweight chambers and maintaining therein predetermined water levels, movements of the gate are controlled automatically. For each reservoir level there is a corresponding gate opening at which all forces are in balance.

One end of the cable supporting the sheave from which the plug on the needle-type valve is hung runs to a float in the float chamber. The other end of the cable is attached to a drum on a sprocket wheel that turns as the counterweight and radial gate move. Any rise in reservoir level will cause the float to rise and slack off on the cable, thereby causing the plug in the outlet valve to open. Conversely, any opening movement of the radial gate will cause the plug to be lifted, tending to close the outlet from the float well into the counterweight chamber.

Each counterweight chamber is provided with a restricted drain that remains open at all times so that some water must be admitted to the counterweight chambers through the needle-type valve to maintain water depth in that chamber. Consequently, for any stage of the reservoir there is only one gate position at which flow through the needle valve will exactly balance the outflow from the counterweight well.

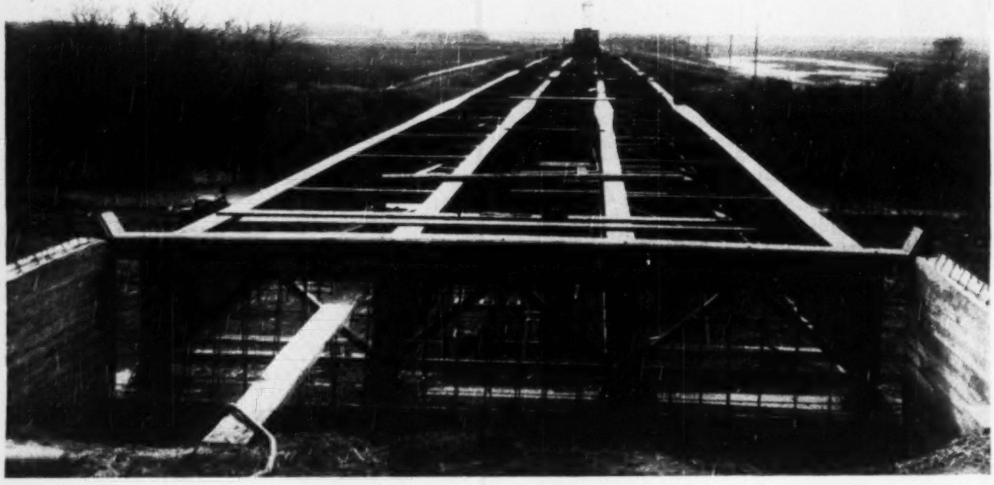
• **Those Responsible**—The works for enlargement of Horseshoe reservoir by installation of radial gates in the spillway were built at a cost of some $900,000 for the Salt River Project Agricultural Improvement and Power District, Phoenix, Ariz., of which Richard D. Searles is president and Stanley A. Ward is general manager. Designs were made and construction supervised by Leeds, Hill & Jewett, consulting engineers, Los Angeles, Calif., with Raymond A. Hill directing the work. N. D. Whitman, Jr., Pasadena, Calif., was structural engineer and Victor S. Fago was resident engineer.

Excavation and concrete work for pavement, walls and piers in the spillway channel was done by Daley Construction-Acme Materials Co., Phoenix. Steel fabrication and installation of gates was carried out by Allison Steel Mfg. Co., Phoenix.



AUTOMATIC GATE OPERATION involves submergence of the counterweight, decreasing its effective weight and allowing the gate to open.

HUGE SIZE OF GATE is emphasized by a man walking on spillway crest.



Welded girders proved economical—but even more money could have been saved on . . .

Kansas' First All-Welded Bridge

• Improvements needed in existing specifications include: correction of requirements for deflection, web thickness, stiffeners and weld sizes.

George W. Lamb
District Engineer
American Institute of Steel Construction
Topeka, Kan.

E. S. Elcock
Bridge Engineer
Kansas State Highway Commission
Topeka, Kan.

NEED for more realistic specifications for design and erection of welded plate-girder bridges is brought out strikingly by the experience of the Kansas State Highway Commission with its first all-welded bridge.

The structure was designed to meet American Association of State Highway Officials specifications—written primarily for riveted construction.

In some respects, the specifications are difficult to apply to the detailing of welded structures. Some provisions are the result of experience with riveted work and are expressed by empirical formulas, which in many cases do not apply to welded girders. As a result, designs generally are unduly conservative.

In brief, here are the more significant effects that existing specifications had on this bridge—it is a continuous deck-girder structure with spans 84-108-108-84 ft and 26-ft roadway over the Little Walnut River on US 77, 9 miles south of Augusta, Kan.

• **Deflections**—With H20 loading, five 36-in. wide-flange beams weighing 412,000 lb satisfied stress requirements. But to meet a specification that live-load deflection be less than 1/800 the span, weight had to be increased to 680,000 lb. Plate girders proved more economical than the rolled wide-flange beams.

• **Welding vs riveting**—With four riveted plate girders, steel totaled 385,000 lb. With welded girders, weight came to 312,841 lb. Low bid for the welded design was 9¢ per lb for steel fabricated, shop painted and delivered four miles from the site (Sept., 1947) and 4.3¢ for erection and two coats of paint (Feb., 1948). At the time bids were taken, steel was difficult to obtain and contractors and fabricators were not familiar with welding techniques.

• **Built-up girder**—A plate girder 48 in. deep met the requirement for live-load deflection. It was made up by joining the web plate to an upper and lower flange plate with four lines of fillet welds. Sections to be placed over the piers were fabricated in 48-ft lengths and center sections in 60-ft lengths.

• **Flanges**—Thickness was limited to 1¼ in. Specifications require preheating of the base metal prior to welding if thicker material is used. Quite arbitrary, this ruling is enforced without regard for prevailing atmospheric temperatures.

Flanges are parallel, simplifying fabrication. To eliminate cover plates, width is increased from 12 to 22 in. where negative moments are high, the flanges being widened gradually. The taper extends over a distance of 19 ft—from erection splices, near points of zero dead-load moment, to piers. Without this long taper, an extra butt-welded joint would have had to be made in the shop. The added cost probably would have outweighed any saving that could have been made in material by using a short taper, even though the steel trimmed off the 22-in. plate was scrapped.

• **Web**—Thickness was made ⅜ in. to meet specification minimum-thickness requirements based on depth of plate. For riveted girders, web thickness would have been 7/16 in., since the depth is taken as the distance between toes of top and bottom flange angles. An exact analysis based upon the theory of elastic stability would have shown 5/16 in. to be sufficient for the welded girder also.

• **Stiffeners**—Though bars are the most efficient stiffeners for a welded girder, specifications, intended for riveted girders with constant-width flanges, were written with pairs of angles in mind. Under an arbitrary ruling, stiffener bars must be in pairs and must extend to within ½ in. of the edge of the flange. Thickness must be at least 1/16 the width.

Applied to this design, the specifications called for stiffeners near the piers to be pairs of 10x⅝-in. plates—much larger than required for web stability. A saving in material could have been made by using stiffeners on only one side of the web and designing them to meet stability requirements.

Reaction stiffeners are attached to the web and bottom flange with continuous welds. Intermediate stiffeners are welded to the web only. Welds for these components are intermittent fillet, 5/16x2 in., 6 in. on centers. At the ends of the stiffeners, a continuous weld is used to develop the strength of bracing connections.

• **Bracing**—Spaced a maximum of 20 ft. apart, cross frames consist of 4x4x⅜-in. angles welded to the stiffeners. Bottom struts brace all four girders, whereas the top struts and diagonals are omitted from the center bay. The diagonals slope down from the top flange of the interior girders to the bottom flange of the exterior girders. They will be in tension under dead load, for which condition the outer girders have the larger deflection.

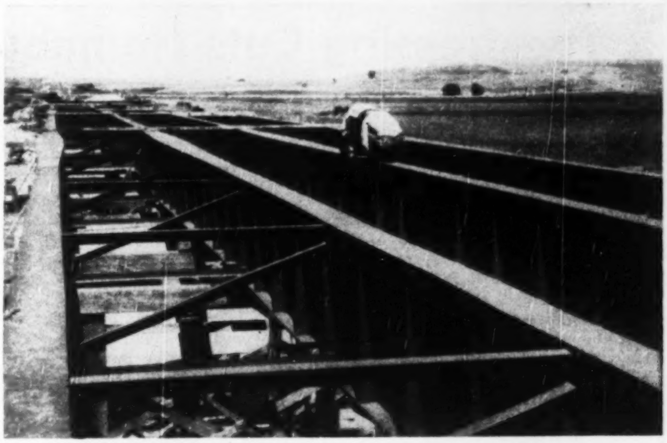
• **Web-to-flange welds**—Designed originally as 3/16-in. continuous fillet, these welds were sufficient to develop shear. American Welding Society specifications, however, require a minimum of 5/16-in. fillet welds for material 1⅛-in. thick, to avoid weld cracking during cooling. Finally, to provide a continuous connection and to seal the joint against corrosion, the designers called for 5/16-in. continuous fillets—an increase of 200% in weld metal over the original design.

• **Flange welds**—Material for the field butt welds was beveled so that 15 of the required 20 passes could be deposited downhand. Extension plates (runoff bars) were attached at the ends of each weld. Welding was started on one of these plates and completed on the other, eliminating the possibility of end defects occurring in the joint. Later the bars were removed and the flange edges ground smooth.

To facilitate butt welding at the intersection of web and flange, a 1-in. dia semi-circular piece of steel was coped out of the web there, providing a hole big enough to permit passage of the electrode. The hole was later filled with weld metal, but the advisability of this operation is open to question, because of the risk of causing a weld defect.

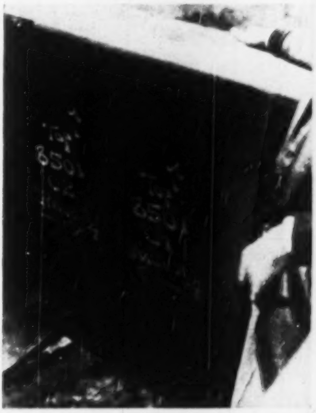
• **Future prospects**—The welded design used on this project was well justified economically. If a suitable design specification for welded structures—based on research and experience—can be formulated, future designs will show even greater savings than experienced thus far.

The project was executed under the general supervision of R. C. Keeling, state highway engineer, with H. O. Reed as engineer of construction and L. S. Munn as division engineer. Design was initiated by George W. Lamb, while bridge engineer for the Kansas Highway Commission, and the structure was erected under the advisory supervision of E. S. Elcock, present bridge engineer.

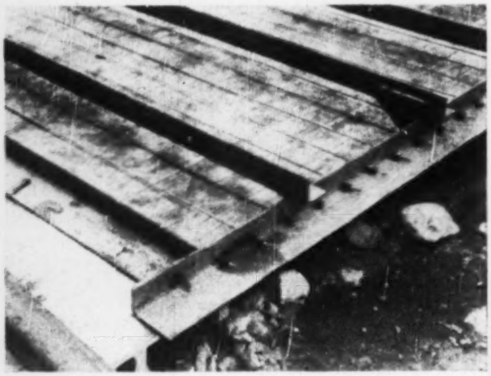


BRACING for the four-span continuous deck-girder bridge over the Little Walnut River, Kansas, was welded to the stiffeners.

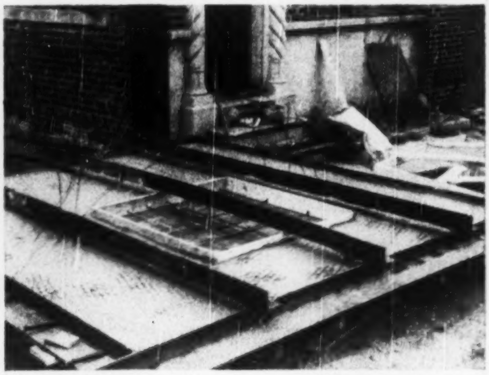
SPLICES were made with the aid of bolted plates and yoke clamps until . . .



CONTINUOUS WELD was completed; bolt holes then were filled.



1 WIRES between steel-angle form for wall unit (Fig 1 to 3 show experimental slab made in U. S.) were stressed to 120,000 psi by tightening nuts with a wrench. After this . . .



2 STRUCTURAL CONCRETE was placed to a depth of 1½ in. and scored with mesh to bond with 2½ in. of concrete insulation. After concrete hardened, forms were removed and . . .

Prestressing Cuts Homebuilding Costs

Jacob Feld
Consulting Engineer
New York, N. Y.

THE POSSIBILITY of using prestressed concrete to lower homebuilding costs in all parts of the world is indicated by the construction at low cost of prestressed-concrete houses in Israel.

Walls and roofs of these houses are a prestressed, precast composite of insulating and structural concretes. Total thickness is only 4 in.

Although the design and construction methods were developed for use in regions short of building materials, powered equipment and skilled labor, they are also applicable elsewhere. This type of construction, for example, is now being planned for houses in Queens, New York City, and consideration is being given to adapting it for building U. S. Army barracks.

• The problem—The basic conditions set for the design of the Israel houses were:

1. Use of lumber and metals must be kept to a minimum.
2. No powered equipment is available, but unskilled labor is plentiful.
3. Operations must be simple, even though local labor can be readily trained to perform special tasks.
4. Buildings must be insulated for high temperatures and also provide for freezing weather; crude-oil space heaters are satisfactory.
5. Existing standards are low: A unit consisting of a single large room, a small kitchen and a toilet is considered satisfactory. Provision must be made for at least that much space, with running water and septic tanks.
6. The customary house has masonry block walls, the preference for masonry over timber frame (even where lumber is available) being a carryover from ancient European custom.
7. Cement and satisfactory aggregates are available.

• The solution—These considerations led to the use of a prestressed, precast concrete structure with monolithic concrete-foam insulation. (The insulation alone, early developmental work showed, was not strong enough to sustain the prestress.) No lumber is needed for forms. Steel, which has to be imported, is kept to a minimum. And the structure can be erected without powered equipment.

First designs indicated such economy that the family units were increased to three rooms each. Further, houses now being built in Israel indicate a total cost of about two-thirds that of a conventional two-room block house.

The prestressed buildings each contain two symmetrical family units and are about 25x30 ft in plan. Each three-room unit requires about 300 lb of prestressing wire, this being the only expendable material imported. The others—steel angle forms, hand-operated hoisting-chain blocks and prestressing tools—are re-used almost indefinitely.

The design was checked by constructing experimental walls and roofs in New York. All the work was done by three common laborers with a limited knowledge of English. In this way, both the experience and language barriers that would be encountered in a foreign land were simulated.

• Initial construction steps—The procedure that was used in Israel is as follows:

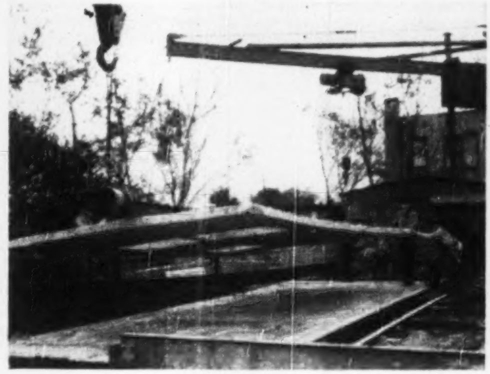
Hand labor prepared a concrete floor or a stabilized earth floor (common in many foreign lands and preferred to concrete). Either type can be covered later with tile or other finish if the occupants have the means.

To form a foundation for the walls, laborers, using a sort of scoop pulled like a hoe (rather than a shovel), produced neat trenches for placement of concrete mixed by hand. The top of the footings was grooved to receive the walls.

The floor served as a form for walls and roof, and steel angles outlined the units. Laborers pulled ¼-in. wires for prestressing through holes located in these angles about ¾ in. above floor level (Fig. 1). Made of hard-drawn high-carbon basic steel, similar to material used in suspension bridges (ASTM A227), the wires had pressed buttons at one end and threads on the other, for anchoring to the angles. Angle bracing was provided between the form angles to resist the prestress.

• Prestress applied with wrench—The laborers, using a hand wrench, tensioned each wire by turning on a ¾-in. long nut having 15 threads in contact. When a computed elongation—about 0.004 the wire length—was obtained, the stress was the required 120,000 psi.

To equalize the stress in the wires,



3 SLAB was lifted and erected to form a wall—without cracking. Corners of building were cast in place. Finally, roof slabs were erected. With modifications, this method was used for . . .

4 HOUSING PROJECT in Israel, one building of which is shown above. It is a two-family house, 25x30 ft in plan. Each unit contains two rooms, plus kitchen and bathroom.

the men plucked them with a stick or rule, adjusting the strain by turning the nuts until all the wires gave off the same tone as a tuning fork having the computed vibration period. The method requires no gages or complex equipment. And it is simple and positive: As little as a sixteenth turn of the nut either way has been found to kill the sympathetic vibration of wire.

• **Two types of concrete placed**—With the wires at the proper tension, the laborers placed in the form a 1½-in. thick layer of hand-mixed 3,000-psi structural concrete made with stone or gravel of ⅜-in. maximum size (Fig. 2). Immediately thereafter, they prepared a soupy mix of cement and fine dune sand, to which they added an aluminum powder. They spread this insulation mix over the structural concrete to a 1½-in. depth. The mix rose, like dough made with yeast, as hydrogen bubbles formed. Thickness of the layer increased to 2½-in. The unit then was 4 in. thick and weighed about 35 psf.

The surface of the structural concrete in Fig. 2 had been roughened by pressing expanded metal into it. This was found to be unnecessary.

After the strength of the lower concrete reached 1,500 psi—in about two days in normal weather—the men cut off the buttons of the wires and took off the nuts. It was easy then to remove the forms, since the concrete had shrunk away from them. Shrinkage amounts to over ⅜ in. in a 9-ft wall height.

• **Units lifted by hand**—Two men using two chain blocks suspended from pipe or timber frames lifted a unit easily; others rotated it into position. During early developmental stages, a steel beam was connected to the slab above its center of gravity for lifting purposes (Fig. 3), because of the weight of the unit (the center wall separating two family units is 9x30 ft, weighs nearly 5 tons). However, it was found later that the angle form at one edge could serve satisfactorily as a lifting medium.

The walls were set up successively. Corners were then filled in by attaching vertical metal or wood forms to the walls and placing in these a few pails of concrete mortar, thus forming L- or T-shaped columns. In this way, irregularities of the wall edges were covered. The ends of the wires act as dowels.

Finally, the roof slabs, cast in 2-ft wide sections with ship-lap joints in the sides, were placed on top of the walls. No finish was needed on the outside or inside of the buildings other than cement paint. (Though these walls and roofs were exposed during the past winter, no cracks have developed in the exterior, and the insulating concrete did not separate or peel at any time. Insulation value is better than that of a 12 in. solid masonry wall.)

• **Plumbing installations**—The plumbing had been drawn up in isometric form. Each precut piece of pipe and its fittings were numbered. Hence, the laborers were able to assemble the plumbing readily on the site.

• **Material requirements**—The materials required for a double unit are 616 lb of wire, 12 cu yd of foundation concrete, 8 cu yd of structural concrete and 13 cu yd (expanded volume) of concrete insulation. Enough form angles were shipped abroad to pour the walls for one house. After ten uses, they were still in good shape.

Labor required for a two-family unit totals 565 man-hours for the excavation and concrete work. Mechanical and other operations use up about 50 percent more.

The schedule of operations permits completion of a house in two weeks from the start of excavation.

• **Design approved by NYC**—A group of houses of similar design are to be built in Queens, New York City. There, two recently developed, simple grips, which will replace the buttons and threads on the wires, will be given a full-scale test. Also, the builder will pour the three long walls as a single unit on the floor, with prestressing wires extending through all three. Plywood strips will separate the walls. After the concrete has set, the strips will be removed and the walls freed from each other by snipping the wires. Concrete will be mixed in transit and powered equipment will be used for lifting.

An approval has been received from the New York City building department for the modified plan, empirical wall thickness requirements in the code being waived for this design.

• **Costs are low**—With the cost of forms and tools apportioned to the first ten family units, plus the cost of the imported wire, plumbing, local materials, labor and overhead, each of the first ten units costs about 700 pounds (Israel currency). What that means in U. S. funds will be determined when the Queens houses are completed.

David Rose, New York builder, personally directed all operations—and paid all costs. The author developed the designs and construction procedures.

Euclid Concrete Corp. performed the experimental work in New York. Construction in Israel was under the direct supervision of Fanta and Saltpeter, Israeli engineers.

BOOK REVIEWS

Guidance Manual

An Introduction to the Engineering Profession—By John G. McGuire and Howard W. Barlow. 183 pages. Addison-Wesley Press, Cambridge 42, Mass. $3.50.

This is a guidance text. The authors do a fine job of presenting information about the engineering profession that will be of value to freshman students, recent high school graduates, and vocational teachers. Young men who are thinking of engineering as a career will find the book helpful. It describes the nature of engineering and most of the main branches in realistic terms. Some of the treatment is necessarily sketchy.

The book is also designed as a problem text, one-third being made up of problems, including a section arranged according to engineering subjects. Unfortunately, as a problem text, the book contains too much extraneous material and yet not enough problems to appear to justify asking students to purchase it for that purpose alone. On the other hand, the problems may be a help to the boy using the text for guidance purposes to get a better idea of the type of problems met in the several fields.

For Civilian Defense

The Effect of Atomic Weapons—Prepared for and in cooperation with the U. S. Atomic Energy Commission and the Department of Defense under the direction of the Los Alamos Scientific Laboratory. 456 pp. McGraw-Hill Publishing Co., New York 18 and London. $3.

All the information that has been made public about atomic bombs that is needed by those planning for defense of civilians against atomic attack can be found within the covers of this book. Main subjects covered are: Principles of an atomic explosion; description of an atomic explosion; shock from air burst; shock from underwater and underground bursts; physical damage; thermal radiation and incendiary effects; initial nuclear radiations; residual nuclear radiations and contaminations; measurement of nuclear radiations; decontamination effects on personnel and protection of personnel. With this information in hand, anyone who wants to go back of the conclusions given in the section on protection of personnel can do so with facility.

The section on protection uses bomb bursts in a hypothetical city to present information basic to plans for providing the maximum amount of protection for people in such a city. It is assumed that destruction will be complete within a half-mile of "ground zero." Beyond that are the limits of severe damage and moderate damage in which various degrees of protection can be provided. Information is given on the limits of dangerous radiation.

Concerning buildings, there is a brief discussion of what can be done to improve the protection provided by existing buildings. More information is given on the design of new structures, including tentative design suggestions for multistory reinforced-concrete or steel-frame buildings, for steel mill buildings and bridges.

Chapter V gives data from which to compute the time-pressure curve for new buildings of any reasonable shape, size or orientation. Appendix A gives an approximate method for computing the deformation of a structure by a blast wave.

(This same book, in paper covers, was issued a few weeks ago by the federal government through the Superintendent of Documents.)

City-State Highway Work

State-City Relationships in Highway Affairs—By Norman Hebden and Wilbur S. Smith. 230 pp. Yale University Press, New Haven, Conn. $4.00.

The problem of what to do with—and who should pay for and supervise—traffic delivered to a city's gates by state highway systems comes in for detailed study in this new book.

Result of more than a year's study of the relationships of states and cities in integrating highway systems, the report starts off with 14 recommendations for improving conditions. These include:

1. The states must assume a large share of responsibility for the improvement of major city streets which serve to distribute highway traffic through the city; 2. The states must define the over-all responsibility they will assume for city streets; 3. Local and state laws must be revised or reviewed to establish responsibility for street maintenance; 4. Clearly defined and uniformly applied working procedures must be established, with as much local administration and supervision as possible; 5. Informal regional committees or metropolitan authorities should be utilized to give overall view of the integration of projects into the general system.

The authors—with the aid of an advisory committee—studied 22 cities in 12 states before reaching their conclusions. Their report carefully details the development of the U. S. highway system, and of the community-level streets.

Books on Foundations

Structural Foundations—By R. R. Minikin. 359 pp. Published by Crosby Lockwood & Son, London. Obtainable through Stechert-Hafner, Inc., 31 East 10th St., New York. $4.50 plus postage.

Piling for Foundations—By R. R. Minikin. 196 pp. Published by Crosby Lockwood & Son, London. Obtainable through Stechert-Hafner, Inc., 31 East 10th St., New York. $2.70 plus postage.

Two British books on foundations by the same author have been received in this country. They are "Structural Foundations" and "Piling for Foundations."

"Structural Foundations" is an excellent comprehensive book. It should be more useful to engineers here than the book on piling. The treatment is practical without involved mathematics.

Bearing capacity of ground, effects of footing rigidity, and the Boussinesq theory are covered with the author's own short approximation of tables of Boussinesq values. The Vierendeel and Jankowski theories of earth pressure are compared graphically with the Rankine theory. The difference in bearing capacity between dry and wet sands is explained. Methods of making and interpreting load tests and field tests for clay shearing values are shown. Soil mechanics principles are explained simply and applied.

Retaining wall failures are fully explored, and the Rankine, revised wedge, and Rebhann theories are shown and compared with the author's theory. Uplift shape of walls and lateral movements are considered. The author includes only the triangle of earth resting on the back toe of a wall footing in resisting moment values, and takes the center of pressure at 0.5H on a line through the center of gravity of the wedge. He recommends a factor of safety should not be less than 2.2. Intensities of pressure from wet and dry backfill are compared. The author frowns on the use of passive pressure.

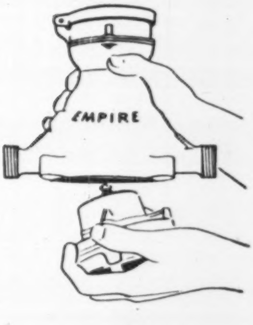
Bridge abutments, machine foundations, timber grillages, and pole foundations are shown, also designs of reservoirs and reactions from viaducts and tall chimneys. Chapters are devoted to numerical examples of combined footings and methods for artificial consolidation of ground.

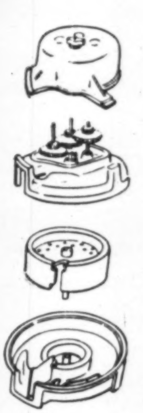
The author is astonished at frequent neglect of adequate subsoil in-

(Continued on page 53)

ROCKWELL
EMPIRE
Oscillating Piston
WATER METERS

COST LESS TO REPAIR



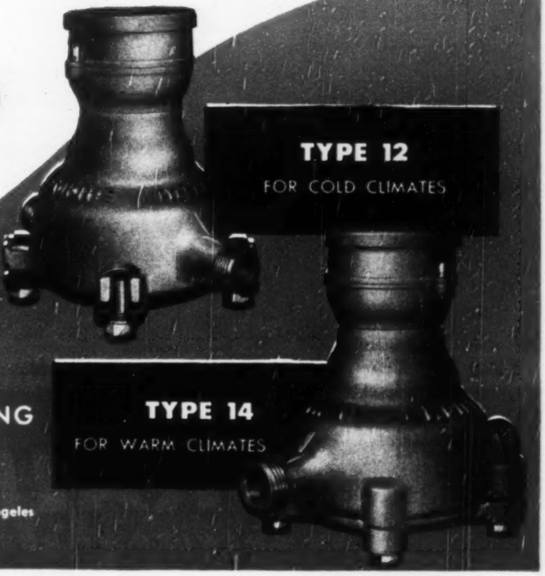


Here is the simple arrangement of measuring chamber and gear train parts in Rockwell-built Empire water meters. Note there are only three interior castings. They assemble without the use of any screws. Fitting is quick, positive. The assembled mechanism can be tested for its free running qualities prior to being bolted in the meter case.

Empire meters have fewer parts—better parts—exactingly interchangeable parts. Dismantling and assembly is quick, easy—to save time and money in meter shop operations. Thus the noted initial long life of these meters can be economically renewed to give many more years of uninterrupted service.

ALL INTERIOR PARTS ASSEMBLE AS A COMPLETE UNIT FOR INSERTION IN CASE

- SIMPLE CONSTRUCTION
- INTERCHANGEABILITY
- FEWEST WORKING PARTS



TYPE 12
FOR COLD CLIMATES

TYPE 14
FOR WARM CLIMATES

Rockwell MANUFACTURING COMPANY
PITTSBURGH 8, PA.
Atlanta Boston Chicago Columbus Houston Kansas City Los Angeles
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Lorain 820 HAS *PLENTY* of WHAT IT TAKES for ROCK!

▸ Got some *tough* digging? Put a Lorain-820 on the job . . . and watch things happen! Big Lorain-820's in the 2-yd. class, have the stamina to stick with the hardest materials . . . whether you're stripping from the top or gouging out the deepest cuts. From dipper to crawler, the "820" is built for those tough jobs. Check the list of features at the right—and then ask your Thew-Lorain Distributor to point them out to you on an "820" in action.

PORTER BROWN LIMESTONE CO., *of Springfield, Tennessee loads trucks at a fast rate with their 2-yd. Lorain-820.*

820 HAS PLENTY OF TURNTABLE ADVANTAGES

Hydraulic coupling—no engine stall; no machinery shocks; no engine loafing ★ Double center drive pinion which applies power directly; (a) fully concentrated on any one operation or (b) spreads power for high-speed simultaneous operations ★ Extra wide clutches

820 HAS PLENTY OF CRAWLER FEATURES

Independent crawler travel ★ Chain drive ★ Two speeds in either direction ★ Steers either direction ★ 4-way ratchet and pawl travel and tread lock ★ Propelling mechanism runs in oil bath ★ Wider treads—extra strong, heat-treated drop forgings

820 HAS PLENTY OF SHOVEL FEATURES

Positive chain crowd ★ All-welded, all-steel, torsion-resisting boom ★ All-steel dipper stick ★ Drop forged crowd rack ★ Power dipper trip—saves time and operator's energy ★ Automatic crowd brake to hold stick extended

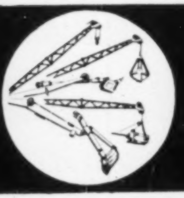
820 HAS PLENTY OF CRANE, DRAG, CLAM FEATURES

Interchangeable to Cranes, Clams or Drags ★ Simultaneous hoist, swing and travel (or boom derricking) ★ Worm driven high speed boom hoist ★ All-purpose Crane Boom head—6 part line ★ High gantry available (power lowered) ★ "Cable-Miser" fairlead ★ Large diameter boom head sheave for Draglines

THE THEW SHOVEL CO., LORAIN, OHIO

THEW LORAIN®

on CRAWLER or RUBBER



SHOVELS
CRANES
DRAGLINES
CLAMSHELLS
HOES

(*Continued from page* 50)

vestigations and foundation design, and emphasizes that ready tables of safe bearing values or adjacent experiences are not adequate substitutes.

"Piling for Foundations" briefly covers bearing piles, sheet piling and uses of piles. Theories and driving practices described are those in use in Great Britain. Pile descriptions are confined to precast concrete, H, box, and specialized British or European types. Only drop, double-acting and British semi-automatic hammers are covered. Dynamic and static formulas are studied and the author's own combined formula presented.

Emphasized are advantages of test piles, or pretesting, using small-diameter piles, driving or jacking point and shell alternately to separate end-bearing friction. This is worth more study in the United States.

The final chapter opens with discussion of the needs of piles and avoidance of damage to adjacent existing structures.

Methods of design of piles as columns are given, including the recent useful Manning method for use where horizontal forces occur or piles are very slender.—Reviewed by Robert D. Chellis, Boston, Mass.

Miscellaneous Notes on Booklets and Reprints

All Papers and Discussions at the United Nations Scientific Conference on the Conservation and Utilization of Resources, held at Lake Success, New York, Aug. 17 to Sept. 6, 1949, have been published in seven volumes of proceedings. The titles of the volumes are as follows: Vol. I, Plenary Meetings; (II) Mineral Resources; (III) Fuel and Energy Resources; (IV) Water Resources; (V) Forest Resources; (VI) Land Resources; (VII) Wildlife and Fish Resources. An index is published as Vol. VIII. The price of the volumes ranges from $3 to $5. Copies can be obtained from the sales and circulation section, United Nations, Lake Success, N. Y.

Much Engineering Information about the construction of Hoover Dam on the Colorado River is contained in 23 bulletins of the Bureau of Reclamation that are being reprinted by the Department of the Interior. These bulletins cover the general history of the project, the water contracts, geological investigation, design and construction features, special investigations into the structural and hydraulic features of the project, and the studies of cement and concrete. Complete sets of the bulletins bound in cloth are being sold by the Superintendent of Documents, Washington 25, D. C., for $44.85. The same, bound in paper, sells for $29. The price of individual bulletins ranges from $0.50 to $3.00, as shown on a list that will be furnished by the Washington office of the Bureau of Reclamation on request.

A Separate Printing has been made of the report entitled "Guide to Water-Cement Ratio Method of Making Concrete" which was prepared by the Committee on Masonry of the American Railway Engineering Association and was published originally in the association's bulletin 485. The title of this separate pamphlet is "Instructions for Mixing and Placing Concrete". Copies can be obtained from the association's office, 59 E. Van Buren St., Chicago 5, Ill. at 40 cents each in numbers less than ten and for a lesser price in large quantities.

Effect of Sand Grading on the Properties of Mass Concrete is the title of Technical Memorandum No. 6-307 of the Waterways Experiment Station, Vicksburg, Miss. Two series of concrete mixtures were designed using 6-in. trap rock coarse aggregate and eight separate gradings of natural sand ranging in fineness modulus from 3.60 to 1.35. Copies can be obtained from the station (P.O. Box 631) for $0.75.

The Abridged Building Code of the Building Officials Conference of America has been completed after 5 years of intensive work. It is intended for communities that are primarily residential in character and have populations up to 30,000. Supplementary to the more comprehensive Basic Building Code of the BOCA, which has just been published, the abridged code may be obtained from the Building Officials Foundation, 51 E. 42nd St., New York 17, N. Y., for $3 with paper cover, $4.50 with cloth cover. Prices for the Basic Building Code are $5, paper, and $6.50, cloth. Discounts will be given on large quantities.

As a Counter Offensive to a campaign being conducted in some parts of the country by plumbing contractors, electrical contractors and others to persuade owners to deal with them directly rather than through a general contractor, the Associated General Contractors of America have issued a pamphlet entitled "Undivided Responsibility—Key to Lower Construction Costs." It is addressed to the persons, companies or public agencies who find themselves faced with this issue and sets forth concisely the advantages of placing responsibility for an entire building operation in the hands of one individual or company skilled in the direction of such an operation from start to finish. Architects or engineers who find their clients in an uncertain mind on this matter can obtain copies of the pamphlet from the AGC office, Munsey Building, Washington 4, D. C.

New Engineering Books

Hydrology—By the late Daniel W. Mead. Second edition. 728 pp. McGraw-Hill Book Co., New York 18, Toronto and London. $7.50.

Municipal and Rural Sanitation—By Victor M. Ehlers and Ernest W. Steel. New fourth edition. 548 pp. McGraw-Hill Book Co., New York, Toronto and London. $6.50.

An Introduction to Experimental Stress Analysis—By George Hamor Lee. 319 pp. John Wiley & Sons, New York 16; Chapman & Hall, London. $5.50.

Basic Reinforced Concrete Design—By G. E. Large. 334 pp. The Ronald Press Co., New York 10. $5.50.

Recent German Language Books received are: Vol. 1 of L. Bendel's Ingenieurgeologie, published by Springer-Verlag, Vienna, Austria ($27.00). The second volume came out in 1948 $31.50). Also from the Vienna office of Springer is Der Frost im Baugrund, by Robert Ruckli ($9.00); and Statir Der Formanderungen von vollwandtragwerken, By Leopold Herzka ($12.00). From Springer's Berlin office have come Stabilitats-Probleme Der Elastostatik, By A. Pfluger (DMark $34.50); Die Eigen-Schaften des Betons, By Otto Graf (DMark 36.00); and Praxis der Abwasserreinigung, By W. Husmann (DMark 10.50). Copies can be obtained through Stechart-Hafner, Inc., 31 East 10th St., New York 3.

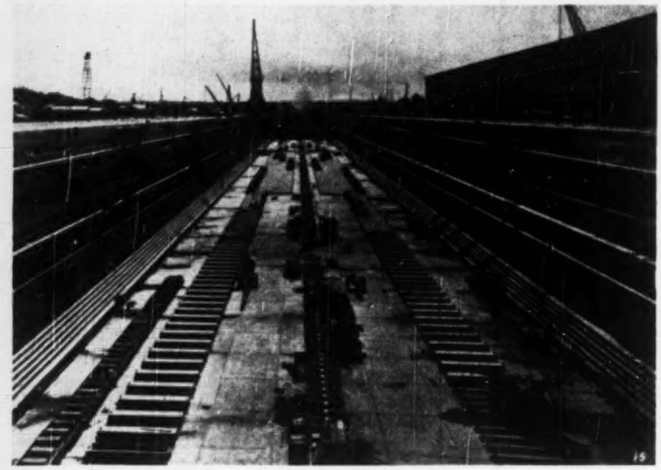
Standard Specifications for Highway materials and methods of sampling and testing—Revised sixth edition. Two volumes. American Association of State Highway Officials, National Press Bldg., Washington 4, D. C. $6 the set.

Principles of Engineering Economy—By Eugene L. Grant. Third edition. 623 pp. The Ronald Press Co., New York 10. $5.00.

California Civil Engineer Registration Examinations—Revised edition. Published by August E. Waegemann, 2833 Webster St., San Francisco 23, Calif. $5.

Rapid Traverse Tables—By Leo Jean Goldsmith. 540 pp. Wm. C. Brown Co., Dubuque, Iowa. $5.00.

DEVELOPMENTS ABROAD



CAPTAIN COOK GRAVING DOCK—This huge graving dock at Sydney, Australia, is large enough to take liners the size of the Queen Elizabeth. The nearest comparable dock facilities are at Singapore, 4,600 miles away.

World-wide dock service of British engineers

During the last year United Kingdom engineers were responsible for more than $18,200,000 worth of work on docks and harbors. The most important works are those being carried out for the government of the Gold Coast at Takoradi Harbor in West Africa. These include a timber depot, extensions to a deep-water wharf, and berths for the shipping of oil and bauxite, in addition to the construction of sheds and the carrying out of land reclamation works. It is expected that the contract will be completed by 1953.

Work is also being undertaken for the Lago Executive Development Board, Nigeria, West Africa, consisting mainly of a deep-water quay, harbor extensions and other works.

British contractors are engaged on some outstanding port works at Lisbon, Portugal. In constructing the quay walls, use has been made of a 100-ton floating crane for blocklaying, the weight of the concrete blocks varying from 50 to 80 tons. In order to set each block in correct position, both as to line and level, a light steel structure of simple design has been employed with much success. It is only necessary to send down a diver after block laying to inspect the finished work.

A difficult problem for the contractors is the large quantities of silt borne downstream by the River Tagus, preventing the diver from seeing under water. The solution has been to use diving bells and similar devices. One type is a normal concrete structure with vertical airlock, moved by a floating crane; another design developed at Lisbon consists of a bell which can be operated independently of a crane, and which can be moved with air in the working chamber. It consists of an ordinary bell, with an air-lock and four vertical guides at each corner which work up and down within a floating pontoon, the position of the bell relative to the pontoon being regulated by two winches.

This new bell has been used with great success for submarine rock excavation, where the first task has been to dredge mud and silt from above the rock, an operation which takes about two hours. A series of holes are then drilled in the rock, the charges of explosive required to shatter it being fired electrically from the bell after the latter has been moved about 55 yd.

United Kingdom engineering concerns have also been instrumental in helping towards the rehabilitation of Continental ports. Three new patent 15-ton level luffing cranes from Britain were recently erected at Le Havre, France, for handling coal and iron ore. Similar cranes are also being installed at the naval and maritime ports of Brest, Toulon, Cherbourg, Lorient, Rouen and Marseilles, in France, and at Dakar, Oran and Bizerta in Africa.

Dredging may often be wasteful unless it is properly planned. Much interest, therefore, attaches to the radio control scheme for a dredger fleet devised by A. H. Howarth, engineer and general superintendent of the Ribble Navigation Co., Lancashire, England, in collaboration with the General Electric Co., Ltd. By using very high frequency radio, he can issue instructions to the entire dredger fleet within a 20-mile radius. The dredgers leave the Preston Dock each Monday and work in the river and estuary until the following Friday or Saturday, during which period the crew live on board. The dredgers can communicate only with the shore station, and not with each other, but the shore station can speak to all dredger masters at once.

International engineering exhibits at New Delhi

For the Indian International Engineering Exhibition to open in New Delhi in January, 1951, invitations for exhibits have been sent to more than 40 countries and to many research and industrial organizations.

The exhibition is being held with the meetings of four other international organizations at New Delhi: The World Power Conference, the International Commission on Large Dams, the International Commission on Irrigation and Canals, and the International Association of Hydraulic Structures Research.

The exhibition will last for about a month. Arrangements such as exemption from import and control duties, supply of cement material and bricks, etc., will be made by the Central Board of Irrigation.

Brazilian highway opened—Inauguration of the 1,056-mile highway from Rio de Janeiro to San Salvador, capital of Bahia state, is scheduled for this month. The road has taken 5 years to build, and at times 20,000 men were employed on it. Total cost is estimated at $15,000,000. It is mostly of macadam construction.

Swiss scenic skyway—A short 4-lane skyway has just been added to the 10,000-mile highway network of Switzerland. It runs through a district where it focuses the attention of motorists on the castle-crowned cathedral city of Rapperswil on the Lake of Zurich. The new highway branches off from the southern lakeside road some 22 miles southeast of Zurich, bridging the lake leading right into colorful eastern Switzerland—the cantons of St. Gallin and Appenzell. It cost about $2,500,000.

(Continued on page 56)

Baltimore's giant new

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The plane hasn't been built that is too big to land at Friendship International Airport. Nor is it likely to be. For in designing this new 3000 acre giant, formally opened by President Truman on June 24 to serve the Baltimore-Washington area, the keynote was expandability.

To Friendship's engineers, this meant not only providing for future passenger and cargo traffic, but selecting equipment on the basis of *long service life and safety.* That's why at Friendship, as in so many of the postwar air terminal and other large buildings designed with Tomorrow in mind, Jenkins Valves are installed.

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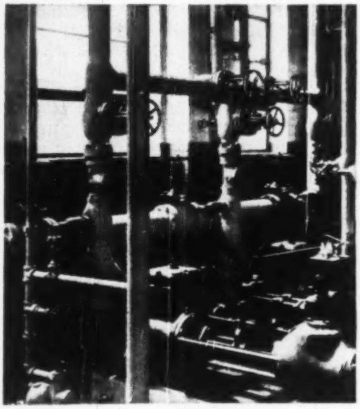

BEHIND THE SCENE at Baltimore's $15 million Friendship International Airport, this view shows several of the 683 Jenkins Valves on 24-hour duty, policing steam, air, water and fire lines.

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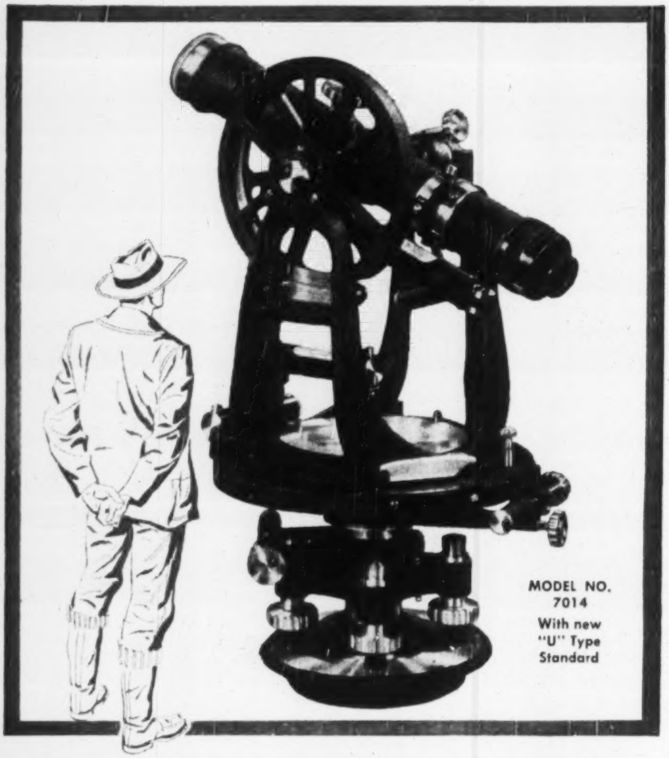

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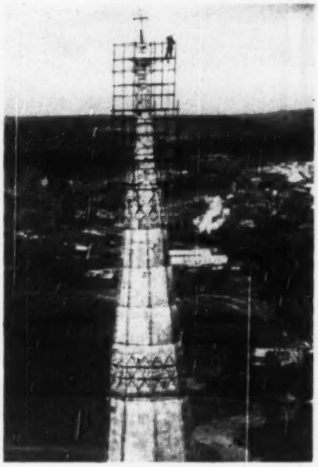

REPAIRING SALISBURY SPIRE—At the top of the spire of Salisbury Cathedral, Wiltshire, England, 400 ft above the ground, workmen erect scaffolding for a job of rebuilding and restoring Britain's tallest cathedral spire. The foundation for this cathedral was laid in 1220. The spire was added about 1330. Within a hundred years of its erection a dangerous settlement took place as a result of which the spire leans 27½ in. toward the south. Recently Architect W. A. Forsythe announced that the spire was badly decayed. Repairs costing about $84,000 call for rebuilding the top 25 ft and restoring and strengthening an additional 25 ft further down.

New Port of Paris—The first dock of the new port of Paris, which port eventually will cover nearly 1,000 acres with 7 miles of quay, has been opened. It is intended for import and export traffic under customs control. It can handle eight of the big Seine barges at a time. The new port, dug out of waste ground in the vast loop of the river downstream from the city, eventually will have six docks. The channel is being deepened and war-destroyed bridges rebuilt to give a 23-ft. clearance.

Roman bus terminal—The first autobus terminal to be built in Italy will be a very large one. It will cost $8,000,000 and will be erected on a site adjoining the new Central Railways station in Rome (ENR, Aug. 17, p. 67). It will take care of 160 motor coaches an hour and will have shops for the motors and for the upkeep and repair of the cars, also an underground garage for 160 motor buses. The building will contain two hotels of 450 rooms each, and also business and amusement centers.

29

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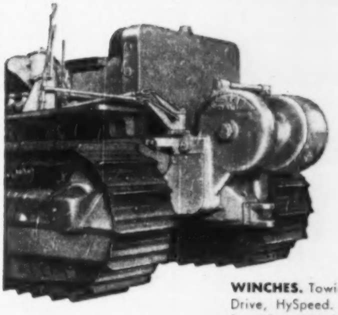

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Standard equipment on Blue Brute 34E Dual Drum Pavers, the automatic, hydraulically controlled water system assures uniformly correct mixing. Designed to go into operation when the skip is approximately 4 feet off the ground, this device closes the water valves when the required amount of water is in the drum. An automatic water-cutoff delaying action, adjustable up to 12 seconds, eliminates holding up the skip until the proper quantity of water has been discharged

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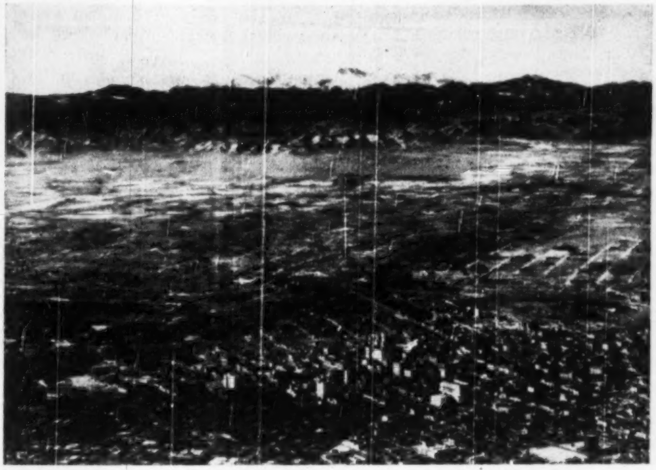

THE MILE-HIGH CITY—Here is Denver with its backdrop of the Continental Divide and Mount Evans, 14,260 ft high. At the left of the picture is the Civic Center, including the Colorado capitol, the City and County Building, the public library and the U. S. Mint. At the right are the Federal buildings and the Daniels and Fisher Tower.—D. L. Hopwood photo.

Denver, Colo., Rocky Mountain metropolis

Denver, with a population around 400,000, is called the little capital of the United States because it has more government offices than any other city save Washington. It is headquarters for more than 220 bureaus and commissions of the government, including the engineering office of the U. S. Reclamation Service. The federal payroll in the city is estimated at $20,000,000 a year. The percentage of home ownership is more than 38 percent.

Denver is served by seven great railway systems, and it is the center of Colorado's highway network. The highest automobile highway in the world leads to the peak of nearby Mount Evans, 14,260 ft. above sea level.

Manufacturing in Denver is widely diversified. The largest industry in the value of products is slaughtering and meat packing.

Denver pays the utmost attention to public health. The purity of its water helps. That water comes from the high mountains and is icy cold and as pure as the snows from which it originates.

There are 35 improved parks in the city's 66 square miles. The parks are not haphazardly spotted here and there, but are located according to plan. Eventually they will be connected by a boulevard system, which is already started. In addition, some 30 parks comprise the Mountain Park system, owned and maintained by the city. The total acreage is 25,000. These mountain parks are connected by five mountain boulevards.

Council-manager plan urged for 47 Pa. cities

A drive for public support of legislation authorizing the council-manager form of government in Pennsylvania's 47 third class cities will be launched by the Pennsylvania State Chamber of Commerce at a meeting in Harrisburg on Sept. 21. The proposed legislation would be optional in character, leaving the decision to local voters in each city.

Invitations have been sent to mayors of third class cities, chamber of commerce secretaries and civic leaders and also to officers of statewide trade associations, women's clubs and labor organizations. State legislators who are members of the Senate Committee on Local Government and the House Committee on Third Class Cities have all been invited to attend.

The meeting will be addressed by

(Continued on page 60)

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T-12

(Top) loader-equipped Tractair breaking asphalt with Le Roi CLEVELAND Air-Jac paving breakers.

(Bottom) Loader wit backfill blade attachment. Both photos show versatility of this unit.

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Richard S. Childs, the "father" of city manager government, who is chairman of the council of the National Municipal League, New York City. Mr. Childs has seen his plan grow since 1912 to its current record of successful operation in nearly 950 communities throughout the country.

◆

Cleveland has plans for Cuyahoga improvements

A $20,000,000 program to improve the Cuyahoga River at Cleveland, Ohio, will be completed in six years, under present plans. The program includes the replacement of six railroad bridges whose abutments now limit the width of the channel for lake freighters; the elimination of Irishtown Bend, for which $2,000,000 in bonds have been authorized by the city; the deepening of Collision Bend and dredging of its turning basin; removal of an Old Central Viaduct pier; dredging of certain stretches of the river to a depth of 23 ft; and installation of a million dollars worth of bulkheading.

Federal funds totaling $4,000,000 already have been approved, and more than $2,500,000 is expected to be voted for work scheduled for 1951. Congress has been asked to appropriate $6,000,000 for use in 1952.

Meanwhile, riverfront industries have embarked on sewage treatment programs, with Standard Oil of Ohio already having spent more than a million dollars to prevent oil waste from polluting the river at its plant. Current plans call for the installation of low level sewers along the 5½ miles on each bank of the river.

Meanwhile Acting Mayor Lee C. Howley has ordered plans drawn for extending Edgewater breakwall at a possible cost of $3,400,000 to create some 150 acres of park land and halt erosion on the Lake Erie front at Edgewater-Perkins Beach.

The breakwall extension would carry the present wall 1½ to 2 miles to Perkins Beach about 2,000 ft out into the lake.

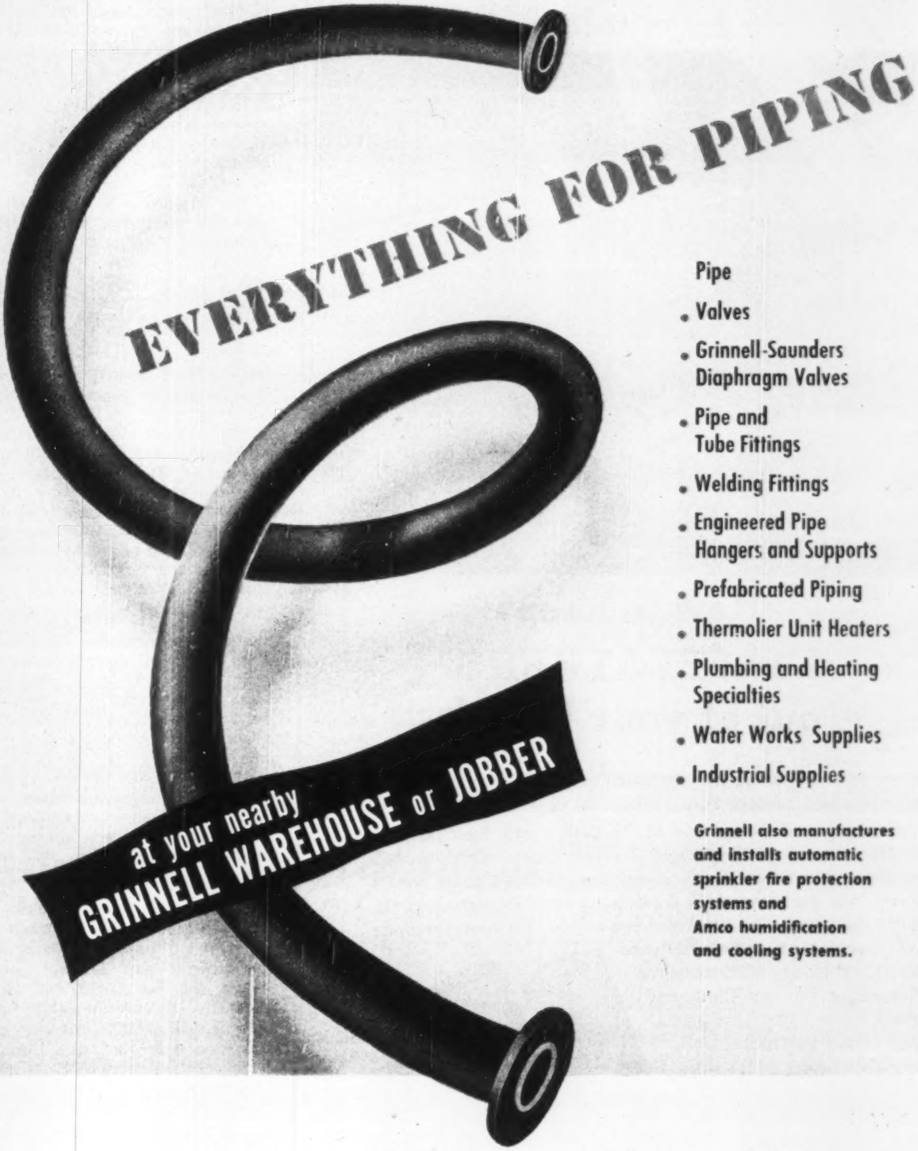
◆

Street-cleaning contest

A regional street cleaning contest for the eastern United States has been announced by the New York-New Jersey chapter of the American Public Works Association.

Full details are to be announced later, but it is probable that the award will be made to the city with the most creditable street cleaning program, rather than to the one with the cleanest individual street. Eligible to enter the contest are cities in New York,

(Continued on page 62)



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AMERICA'S STANDARD FOR OVER 25 YEARS

Pennsylvania, Delaware, the New England states, and the Canadian provinces of Nova Scotia, Quebec and the eastern part of Ontario.

Princeton shopping center

Township authorities at Princeton, N. J., have approved the proposed $3,000,000 shopping center to be developed by Theodore R. Potts.

The rezoned area covers 28 acres and will allow for the parking of 1,840 cars. Besides a department store the center will have a super-market, specialty stores, restaurant, drug store and other retail businesses, and a 3-story office building.

Municipal Briefs

New municipal department—Because the Department of Public Works at Dallas, Tex., has all it can do in superintending its largest municipal construction program, the street cleaning, automotive equipment operations and garbage collection will be taken from its jurisdiction and placed under a newly-created city public service department on Oct. 1, according to Charles C. Ford, city manager.

Niagara improvements—Approximately $300,000 worth of new sewers have been constructed or are under construction this year in Niagara Falls, N. Y., according to H. J. Curtis, city engineer. Other planned improvements total close to $2,500,000, including extension of the water intake tunnel in Niagara River, a new pumping station, a water storage tank and tower, and a new control tower at the airport.

City plan—Work on a general city plan for Troy, N. Y., to include a redevelopment project in River Street and several new housing developments will be started this month. Graduate students in architecture at R. P. I. will assist in this work in cooperation with the city's Bureau of Engineering, headed by R. G. Champagne.

Loyalty pledges—In Chicago the 5,300 employes of the department of public works have been asked to give loyalty pledges. Public Works Commissioner Oscar Hewitt has sent copies of the pledge to all bureau chiefs telling them, "Signing of this obligation is not mandatory. However, I desire that each bureau head personally check the forms returned to him and give me the names of any employes who do not elect to sign and their reasons for not doing so."

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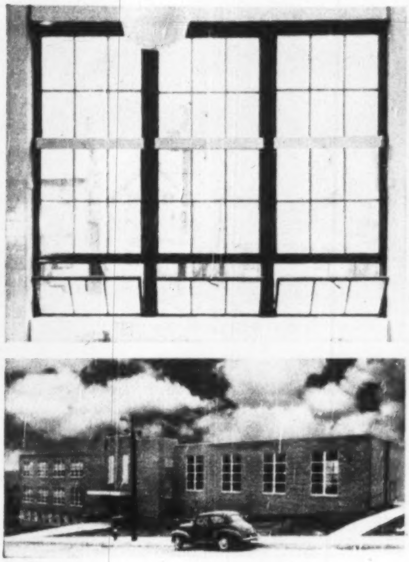

(Left) Interior and exterior views of Truscon Series 138 Double-Hung Steel Windows in North Street School, Hagerstown, Maryland, A. J. Klinkhart, Architect. N. S. Early & Son, General Contractor. Top photo shows window with sill ventilator. Bottom photo also shows Truscon Donovan Steel Windows used in school gymnasium.

Truscon Series 138 Double-Hung Steel Windows in Park Lake Apartments, Hempstead, Long Island, New York. Samuel Paul Associates, Jamaica, New York, Architects. Sol G. Atlas, Great Neck, New York, Contractor.

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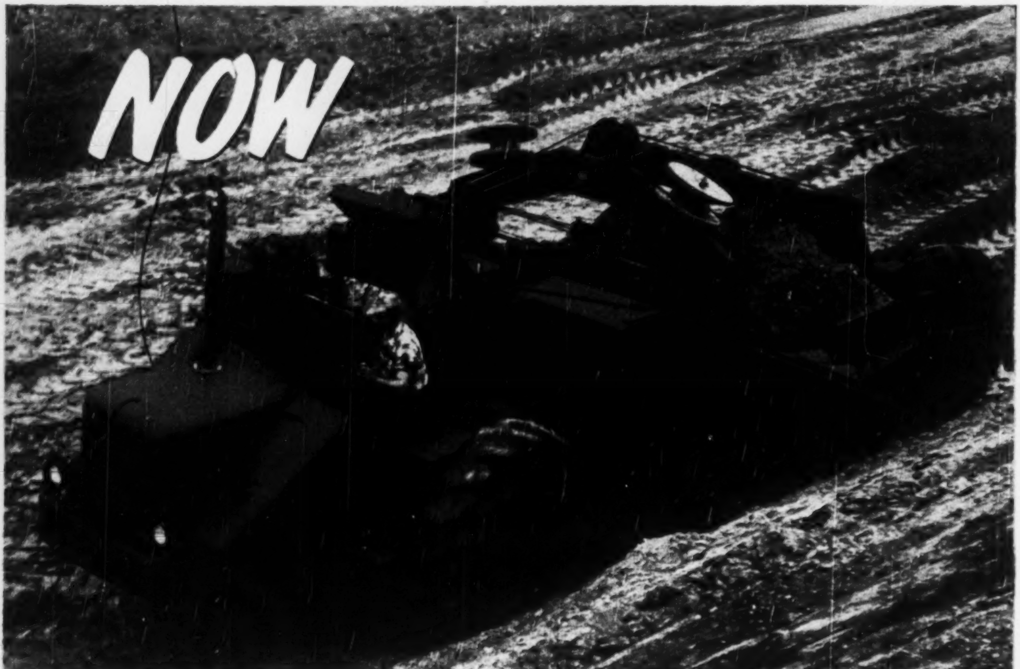

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MEN AND JOBS

Frederick L. Weiss has been named project manager for TVA's Johnsonville steam plant. He had been construction engineer there since October, 1949. Earlier he worked at Norris, Hiwassee and Ft. Loudon dams. **Warren McMahon,** construction engineer for Wilson and Wheeler dams succeeds Weiss at Johnsonville.

Lloyd B. Baker has been appointed first full-time city engineer for Mountain View, Calif., at a starting salary of $475 monthly. A graduate of the University of Wyoming, he was deputy city engineer for Hawthorne, Calif.

Robert P. Carr of Morganton, N. C., a recent graduate of North Carolina State College, has been named city engineer at Morganton.

William Noell Long, of Roxboro, N. C., has been named sanitation engineer for Gaston County, N. C., with headquarters at Gastonia. He formerly served as sanitary inspector for Person County at Roxboro and recently obtained his master's degree in sanitary engineering at the University of North Carolina.

Col. Joseph S. Gorlinski, who has been with the U. S. Army Corps of Engineers for 32 years, is taking over as executive officer of the Central Valley Region Water Pollution Control Board upon his retirement as Sacramento, Calif., district engineer. Central Valley Region is one of nine set up by the 1949 California legislature to control and abate pollution of underground and surface water supplies (ENR July 21, 1949, p 29). From 1934 to 1936 he was resident engineer in charge of construction of Bonneville Dam in Oregon, and in 1940 he was transferred to the Chief of Engineers office in Washington, D. C. In 1944, he became chief engineer on Gen. Albert C. Wedemeyer's staff in the China war theater.

L. R. Douglass has been appointed acting director of power of the Bureau of Reclamation's Boulder Canyon project, pending appointment as director of power. He was graduated from the University of Colorado, Boulder, and joined the staff of the Chief Engineer's Office of the bureau at Denver in 1933. He worked on the design of Hoover Dam, and in 1937 was appointed the first Safety Engineer of the bureau. In 1941 he became assistant to the supervising engineer on construction of water conservation and utilization projects under the Wheeler-Case program. He was appointed consultant to the National Resources Section, G. H., Supreme Allied Powers, on land reclamation in Japan, in 1948.

A. F. Cousins has been appointed highway engineer of Cass County, N. D.

William R. Hunt, assistant city engineer at Indianapolis, Ind., has been appointed chief of the engineering staff (city engineer), succeeding M. G. Johnson, who resigned to join a private engineering firm. Hunt, member of the department since 1930, had been Johnson's chief assistant.

Brig. General Frederic B. Butler has taken over as commanding officer of the Granite City Engineer Depot and becomes the first general to command the installation. He served in the European and African theaters in World War II and holds the Distinguished Service Cross, the Bronze Star and Purple Heart, and the Legion of Merit. He is a West Point graduate.

James Pullar, of Moncton, N. B., has been appointed building engineer for the Atlantic Region Canadian National Railway, succeeding **H. J. Crudge**, retired.

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The Virginia Highway Department has appointed **J. P. Mills, Jr.** assistant traffic and planning engineer. Since 1943, Mills has been associate traffic engineer in supervision of highway department's truck weighing and traffic count operations. A graduate of Virginia Polytechnic Institute, he joined the department as chief of a survey party in 1936.

Lieut. Col. Herrol J. Skidmore has been assigned as director of the Waterways Experiment Station, Vicksburg, Miss. Colonel Skidmore, who has been executive assistant for Engineering and Operations, Okinawa District, succeeds **Lieut. Col. R. D. King**, assigned as a student at the Armed Forces Staff College, Norfolk, Va.

J. E. Johnson, who was resident highway engineer at Warrenton, Va., has become acting district engineer for the Salem highway district, to be in charge of state road work in 12 counties west of Roanoke.

Thomas Hagerty has resigned as sanitary engineer of the sewerage division at Richmond, Ky. to become superintendent of the waterworks at Delaware, Ohio.

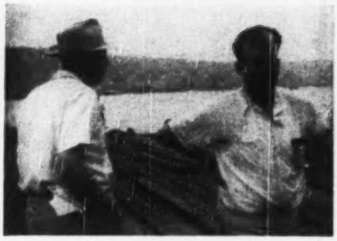
Frederick C. Schlemmer, formerly manager of the Hanford Works of the Atomic Energy Commission at Richland, Wash., has been appointed manager of construction for Burns and Roe, Inc., engineers and constructors, New York City.

Harland Bartholomew, for 34 years engineer for the St. Louis, Mo. City Plan Commission, has resigned. He may become city planning engineering consultant.

Mack A. Arnold president of the Arnold Stone Co. of N. C., Inc., Greensboro, has accepted the post of technical consultant in the Industry Division of the United States High Commissioner for Germany at Frankfurt. He is an expert on precast concrete construction and was sent to Germany by the U.S. Department of Commerce to investigate new types of concrete developed by the Germans during World War II.

D. P. Krynine, professor of soil mechanics at the University of California for the past two years, has opened an office as a consulting engineer at 870 Market St., San Francisco. He will specialize in soil mechanics and allied subjects, continuing his connection with the University on a part-time basis. Professor Krynine taught soil mechanics at Yale, 1929 to 1948.

(*Continued on page 71*)



TROUBLED WATERS on the Hudson River are the reason for the perturbed look on the face of Ray Henry, super for Omaha Dredge and Dock Co., putting Texas gas line across its last major obstacle. At left is Clarence Zarn, engineer on the job.

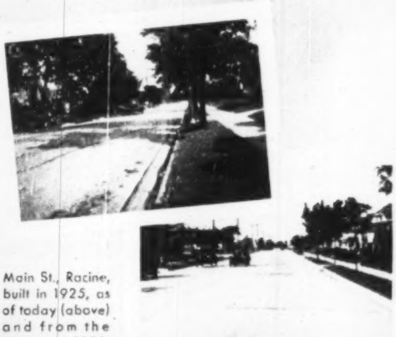
Right in the middle of Brooklyn Bridge, by their air compressors, stand C. E. Adams and Harry J. Terker. Adams is superintendent for Terry steel contractors, Inc., New York, on reconstruction of the historic bridge's roadway. Terker is president of Terry.

On his recent 80th birthday, J. B. John, president of Medusa Portland Cement Co., was honored by the portland cement industry upon the completion of 52 years of service in that field. He became very expert in the building of cement plants and in their operation. At one time he was an officer of three competing cement companies—the Newago, Manitowoc and Medusa later merged into the Medusa Portland Cement Co. together with the Crescent Portland Cement Co.

College Ave., Beloit, built in 1922. Views show the same block as it appears today (left) and back in 1928.

Highland Ave., Clinton, built in 1919, as it appears today (above) and in 1921 (at right).

16th St., Racine, built in 1927, as the same block looks now (above) and in 1928.



Main St., Racine, built in 1925, as of today (above) and from the same spot, 1928.

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. . . that's the story of Wisconsin's Concrete Streets

The fine old concrete streets pictured here give Wisconsin motorists and taxpayers good reason to be proud. For a quarter century or more these pavements have given continuous, **low-annual-cost** service, many of them under weights and volumes of traffic far beyond what they were designed to carry. Yet they still are good for many more years of service.

These photos show only a few of Wisconsin's time-tested concrete streets. The outstanding service record of concrete streets in the dairyland state is typical of the durability and dependability of concrete pavements all over the country. With concrete pavement it's truly a case of "here today—*and still here tomorrow*."

Concrete pavements are also safer. Whether for regular travel or quick stops, driving is less hazardous on concrete because day or night, wet or dry, concrete's gritty surface has uniformly high skid resistance. Its light color is a further safety factor because it increases visibility after dark, when most accidents occur. The same high light reflectance saves on street lighting costs too.

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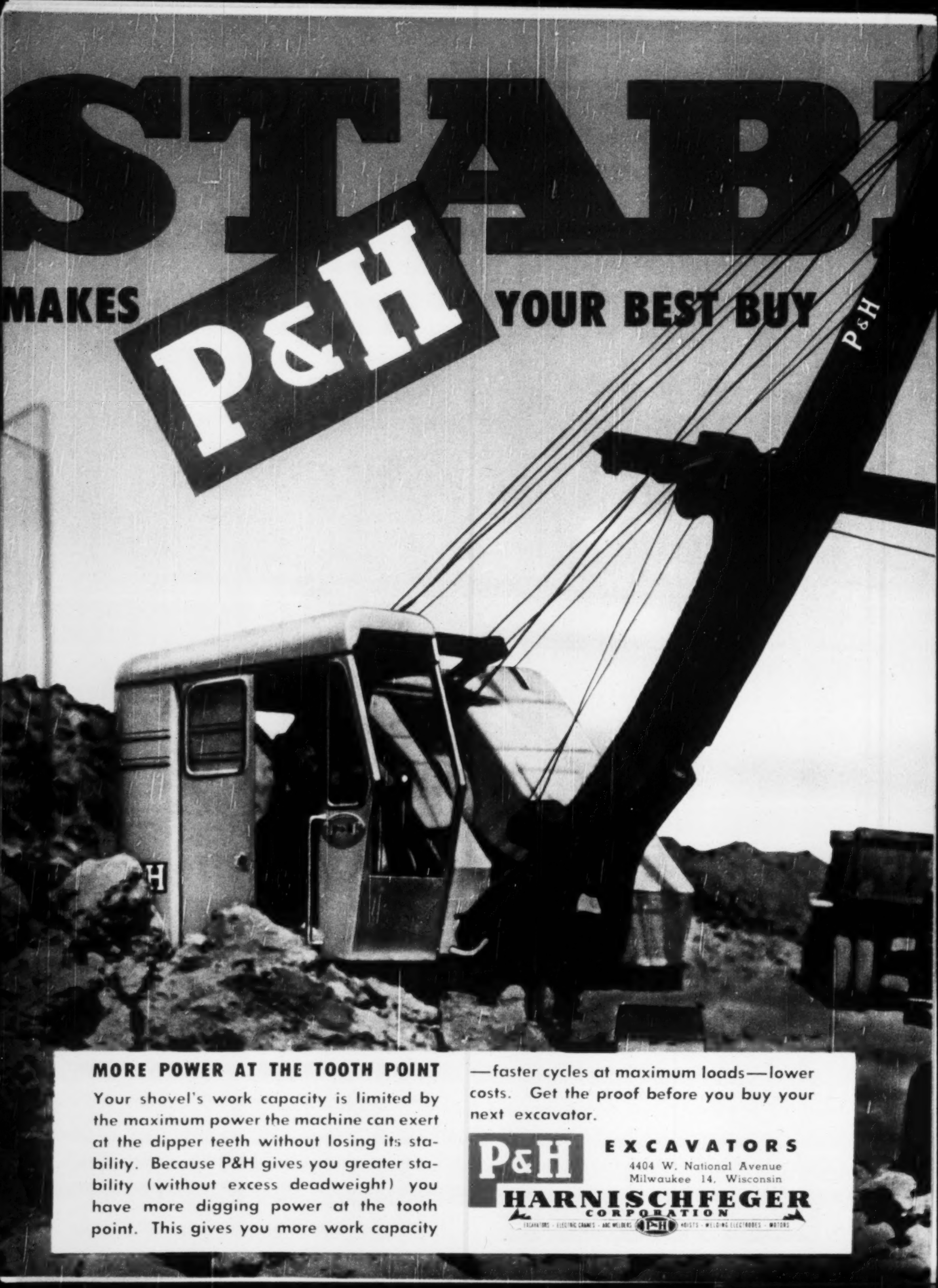

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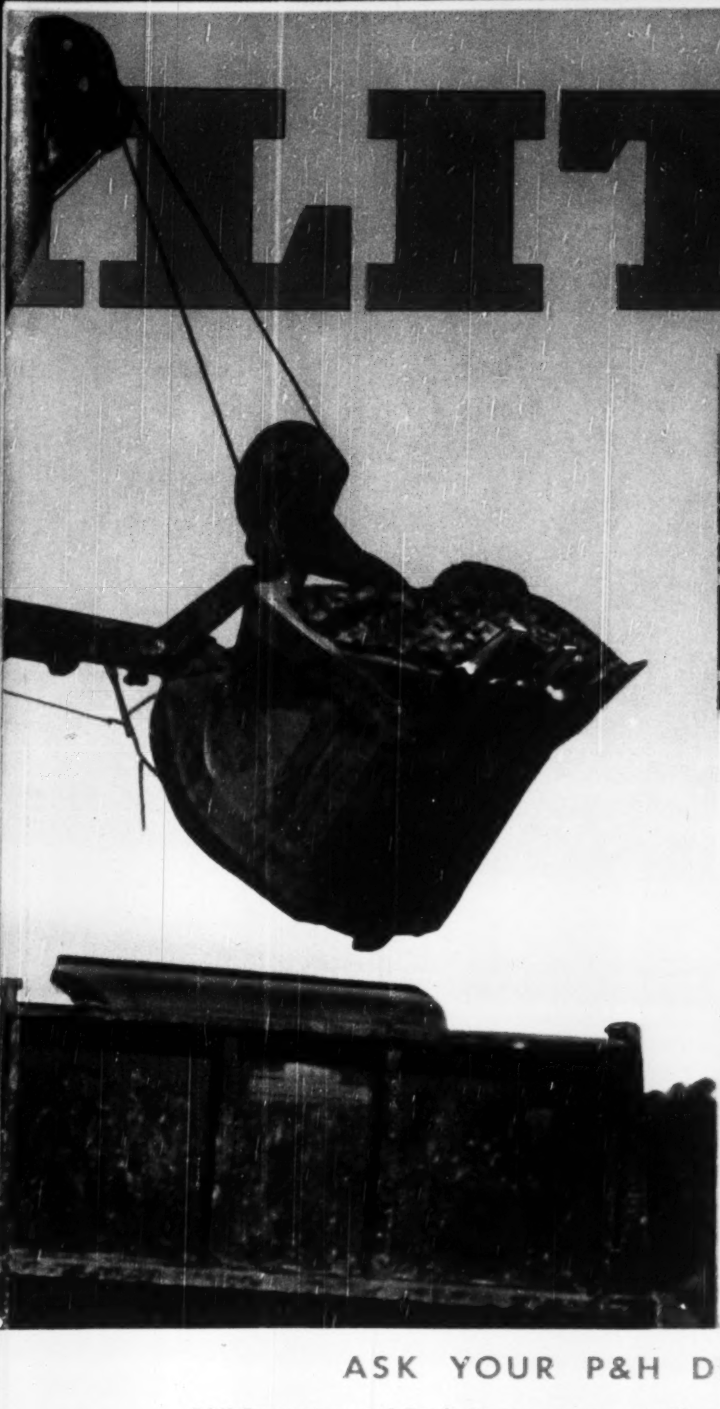

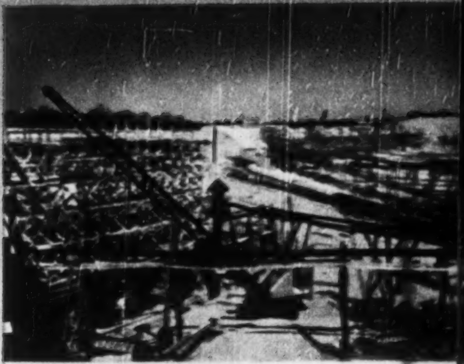

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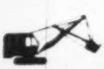
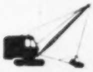
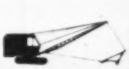
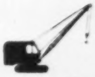
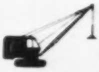
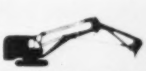

SHOVEL

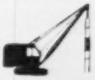

DRAGLINE

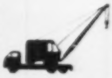

BACKFILLER

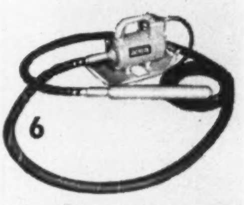

CRAWLER CRANE

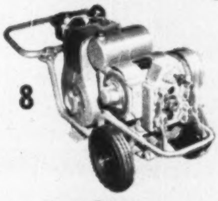

MAGNET CRANE

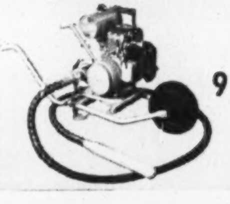

TRENCH HOE


PILE DRIVER


TRUCK CRANE







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Duties as administrative officer, Garrison District, Corps of Engineers, were recently taken over by **B. N. Hannon**, formerly of the Denver district office, where he was executive officer for the last four years. He had spent 12 years at the Fort Peck district office. From 1931 to 1934 he was in the Vicksburg District.

K. K. Stewart and **J. G. Stewart** of the Diamond Construction Company of Washington, N. C., have been assigned to Wilmington, N. C., as designing engineer and office manager, respectively, on the construction of a $2,000,000 concrete and steel dock for the North Carolina State Ports Authority.

James B. Kesting, formerly with the Toledo, Ohio, division of engineering, and **Charles D. Scott**, formerly in the architectural department of American Can Co., have joined the staff of Wernert, Taylor, Sanzenbacher & Morris, Toledo, engineers and architects.

L. H. Lindgren, formerly development engineer in carbide-insert rock bits for Milford Tool Co., Milford, Conn., has established a rock-drilling consulting service for contractors, at Warner Hill Road, Oronoke, Conn.

Col. William Whipple, Jr., who has served as district engineer at Walla Walla, Wash., since 1948, will leave in August to take a 10 months course in industrial mobilization at the Army Industrial College, Fort McNair, Washington, D. C.

Wm. H. Rhodes is district engineering representative of The Asphalt Institute for Louisiana and Mississippi, assisting **Wm. H. Mills**, district engineer at Atlanta, Ga. Mr. Rhodes is a C. E. graduate of Worcester Polytechnic Institute. He was senior highway engineer, U. S. Bureau of Public Roads, in Louisiana.

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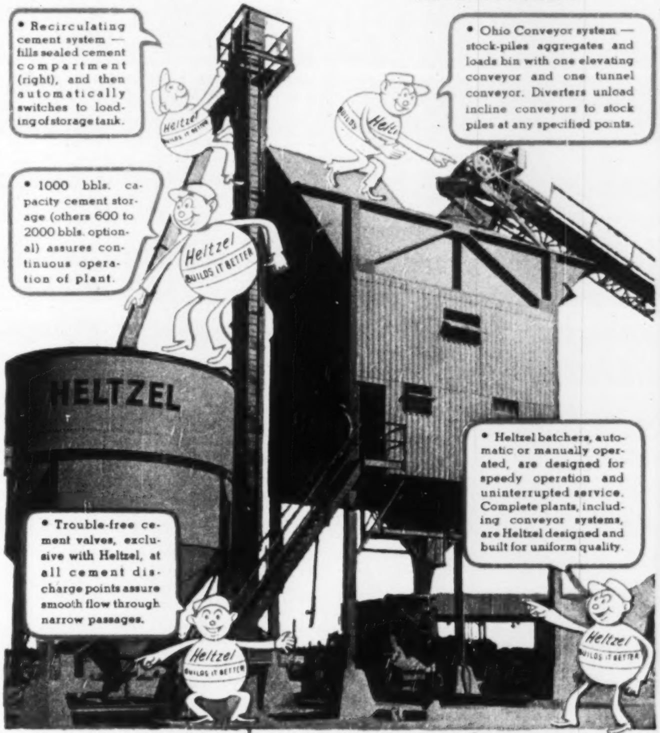

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EDUCATION and RESEARCH

Research for Southern building codes

The Southern Building Code Congress has designated Southwest Research Institute, San Antonio, Tex., a non-profit scientific organization, as its technological research facility. Harold Vagtborg, president of the institute, says that it will research, analyze and develop data on building materials, equipment, designs and techniques. Thereafter, the congress's code research and revision committee, which issues certificates of compliance with the Southern Standard Building Code, may base its decisions on the scientifically accurate reports of the institute.

C. W. Smith, director of the institute's construction technology division, says that, to the best of his knowledge, the agreement marked the first time a group of municipalities has established continuing relations with a non-profit, scientific research organization for technological and engineering studies to provide greater economies and efficiency in building construction, and at the same time to promote better standards of safety and health.

Marion Clement, director of the congress, pointed out that this regional organization is made up of cities with very similar problems. Codes designed to fit northern climates and snow loads or the earthquakes on the west coast do not meet our needs. The congress is determined to keep its standard code up to date and to facilitate the general use of new techniques which will contribute to economy while adequately guarding the health and safety of the public.

Educational Notes

Education survey—Lee H. Johnson, Jr., dean of engineering at Tulane University, is undertaking a survey of engineering education in Texas for the State Legislative Council. It is part of a general review of higher education being undertaken by the state government.

Research contract — International Nickel Co. has awarded a special contract to the Research Division, New York University college of engineering, covering studies of the dimensional stability of stainless steels and of the nature of rupture in stress-rupture tests. The project will be under the direction of John P. Nielsen who has charge of the metallurgical laboratory. Investigations will involve tests measuring the change of shape of high alloy steel plates subjected to non-uniform temperature conditions, and photographic records of the development of rupture in stress-rupture tests.

Hydraulic expert—Thomas M. Lowe, head professor of civil engineering at the Alabama Polytechnic Institute at Auburn, has resigned to become director of the School of Hydraulic Engineering and head of the department of hydraulic engineering at Louisiana State University, Baton Rouge. Professor Lowe served on the faculty at the University of Florida for 14 years. While there he designed and built the fresh water system, recirculation and filtration system at the Marine Studio, Marineland, Fla. Lowe attended Tennessee Polytechnic Institute, Georgia Tech, and Massachusetts Institute of Technology, receiving a B.S.C.E. from M.I.T. in 1925. He earned a master's degree at the University of Wisconsin in 1931.

Additions to faculty—The department of civil engineering, University of Florida, announces these new faculty members: Charles E. Cutts, formerly at the University of Minnesota, to be associate professor, to teach and make researches in structural engineering; Ellwood R. Henrickson, associate professor and associate research engineer. Dr. Henrickson was on the faculty of the University of Wisconsin, his specialty being sanitary engineering; Walter H. Zimpfer, formerly at Rutgers University, assistant professor in research and teaching in soil mechanics; Theodore Jaffe, formerly on the research staff of New York University, assistant professor, teaching and research in sanitary engineering; and Stuart R. Daniels instructor in civil engineering. He formerly was on the faculty at the University of West Virginia. He will teach structural engineering.

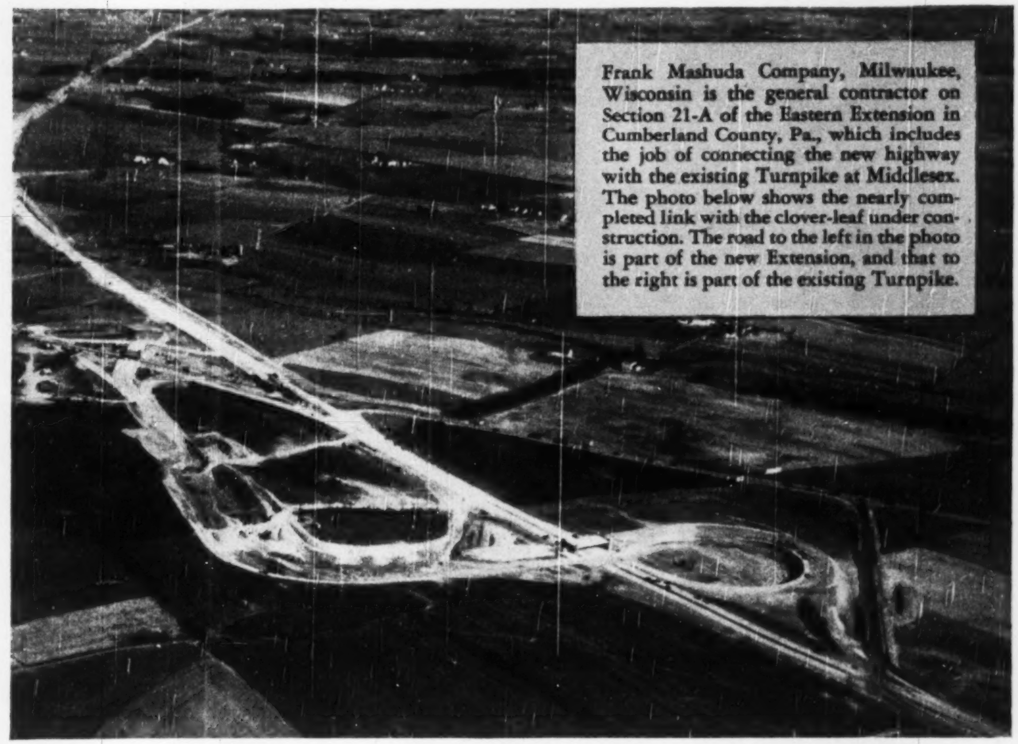
Commercial engineering—Dean Francis M. Dawson, college of engineering, University of Iowa, has announced that the college will offer a modified curriculum in commercial engineering, beginning this fall. It is designed to combine a basic technical training with a sufficient knowledge of business to prepare a student to enter the commercial phases of engineering. The new curriculum will supplement the regular courses in civil, chemical, electrical and mechancial engineering with the additional business training to be given in the college of commerce.

(Continued on page 74)

GULF PRODUCTS *and* FINE SERVICE

keep equipment rolling

on Pennsylvania Turnpike Eastern Extension



Frank Mashuda Company, Milwaukee, Wisconsin is the general contractor on Section 21-A of the Eastern Extension in Cumberland County, Pa., which includes the job of connecting the new highway with the existing Turnpike at Middlesex. The photo below shows the nearly completed link with the clover-leaf under construction. The road to the left in the photo is part of the new Extension, and that to the right is part of the existing Turnpike.

FRANK MASHUDA Company is one of a number of leading contractors on the Pennsylvania Turnpike Extension who find that the use of Gulf products is reflected in better operating records for equipment.

Always of the same uniform high quality, Gulf lubricants and fuels work as a team to help contractors do a speedier, more profitable job. Gulf lubricants provide an extra margin of protection to equipment under all types of operating conditions—and Gulf fuels insure maximum engine power and efficiency.

Write, wire, or phone your nearest Gulf office today and arrange to use Gulf Quality Lubricants and Fuels on your next job. They are quickly available to you through more than 1200 warehouses in 30 states from Maine to New Mexico.

GULF

Gulf Oil Corporation · Gulf Refining Company
GULF BUILDING, PITTSBURGH, PA.
Sales Offices - Warehouses
Located in principal cities and towns throughout
Gulf's marketing territory

How to meet a payroll (at a cost of $3.19)

Twenty-four hours before factory payday, another check-writing machine was needed *fast*. At 10 A.M. plant manager ordered one from supplier 400 miles away. He specified Air Express, the service regularly used to keep production rolling. 26-lb. carton delivered same day at 2 P.M.—in time! Shipping cost only $3.19!

$3.19 was total cost — and *included* door-to-door service! Air Express is the most convenient way for you to ship or receive—in addition to being the world's fastest transportation method.

You get round-the-clock service with Air Express. Shipments go on all flights of the Scheduled Airlines. Air Express is service you can *count on* to keep your business rolling in high gear.

Air Express gives you all these advantages

World's fastest transportation method.
Special door-to-door service at no extra cost.
One-carrier responsibility all the way.
1150 cities served direct by air; air-rail to 18,000 off-airline offices.
Experienced Air Express has handled over 25 million shipments.

Because of these advantages, regular use of Air Express pays. It's your best air shipping buy. For fastest shipping action, phone Air Express Division, Railway Express Agency. (Many low commodity rates in effect. Investigate.)

AIR EXPRESS
GETS THERE FIRST

Rates include pick-up and delivery door to door in all principal towns and cities

A service of
Railway Express Agency and the
SCHEDULED AIRLINES of the U.S.

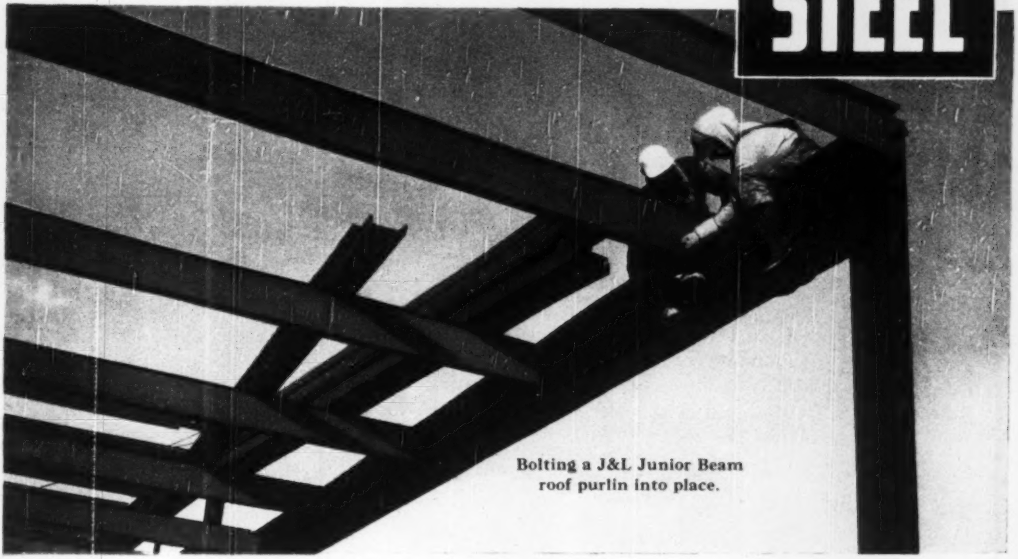
Cyanides in water—Chemists of the Bureau of Engineering, Pennsylvania Department of Health, which is executing the Clean Streams program, have been studying the effects of pollution on fish. It has been found that cyanides in water in an amount of 1,000 parts per million will have no adverse effects upon fish until the cyanides become exposed to sunlight. After that they become lethal and only one part per million of cyanides will cause fish to show distress in 15 minutes and cause death in an hour. The research is being conducted at the Pleasant Gap Laboratory of the Fish Commission with funds provided by the Federal Government under the law which designates appropriations to the states for research into industrial wastes. Water polluted to an extent which will not permit fish to live is looked upon as unsafe for drinking and for recreation, and in many cases is unfit for use by industry.

Wind tunnels—If a measure seeking $3,500,000 of federal funds for the purpose is passed by Congress, experimental wind tunnels will be built at 10 American colleges. Their purpose would be to insure a steady flow of trained personnel for such research, and to provide facilities for advanced training and independent investigation.

Highway Organization—Harmer E. Davis, director of the Institute of Transportation and Traffic Engineering at the University of California, has been named chairman of the Highway Research Board's Committee on Highway Organization and Administration, which will study highway activities with respect to organizational forms, efficiency, extent of jurisdiction, and specific functions. The present Committee will devote its attention particularly to road-department organization at county- and city-government levels. Other members of the committee are Hale F. Hale, executive secretary, American Assoc. of State Highway officials; G. Donald Kennedy, consulting engineer and assistant to the president, Portland Cement Association; D. W. Hanks, Assistant director, American Municipal Association; Norman Hebden, Bureau of Highway Traffic, Yale University; C. M. Nelson, editor, BETTER ROADS; Ben H. Petty, professor of Highway Engineering, Purdue University; L. S. Tuttle, assistant to the commissioner, U. S. Bureau of Public Roads; and W. L. Haas, U. S. Bureau of Public Roads, secretary of the committee.

Per-ton COST of steel construction CUT with JUNIOR BEAM ROOF PURLINS

J&L STEEL



Bolting a J&L Junior Beam roof purlin into place.

Framework of 120′ x 200′ building erected by four men in one week

A construction speed record was established recently when four men in one five-day week erected the entire steel frame-work for an industrial plant 120′ x 200′ in Cleveland, Ohio, for the Standard Products Company.

Just to prove this record was no accident, these same men, during the next two weeks, erected a tool and die shop 340′ x 50′ and a two-story office building 130′ x 36′.

What's more, the estimated cost-per-ton for steel erection was materially reduced because the job went so fast!

J&L Steel Junior Beams used as roof purlins were the key factor that made this speed possible. Here's how:

1. J&L Junior Beams eliminated delays in obtaining structurals made to special order as they were readily available from warehouse stocks.

2. They were light enough for two men to handle easily on the job, and they were bolted into final position as erection progressed.

J&L Junior Beams are light-weight structurals, produced exclusively by Jones & Laughlin Steel Corporation. They are of simple construction, and require no fabrication other than end connections. Junior Beams are rigid, and vibration-resistant . . . have a lower deflection factor than other structurals of equivalent weight . . . are easy to install, fire-safe and permanent.

On Standard Products Company's new plant:
Builders, The Builders Structural Steel Corp.
Structural Engineer, Edward G. Hoefler.
Contractor, Hamman Construction Company,
all of Cleveland, Ohio

Write today for our new booklet, "Skyscraper Construction for Every Building with J&L Junior Beams." It shows how Junior Beams are used as floor joists and roof purlins, with erection details and specifications, loading and spacing tables.

Jones & Laughlin Steel Corporation
428 Jones & Laughlin Building
Pittsburgh 30, Pa.

Please send me a copy of the booklet entitled "Skyscraper Construction for Every Building with J&L Junior Beams."

Name____________________

Company____________________

Address____________________

JONES & LAUGHLIN STEEL CORPORATION

From its own raw materials, J&L manufactures a full line of carbon steel products, as well as certain products in OTISCOLOY *and* JALLOY *(hi-tensile steels).*

PRINCIPAL PRODUCTS: HOT ROLLED AND COLD FINISHED BARS AND SHAPES • STRUCTURAL SHAPES • HOT AND COLD ROLLED STRIP AND SHEETS • TUBULAR, WIRE AND TIN MILL PRODUCTS • "PRECISIONBILT" WIRE ROPE • COAL CHEMICALS

again! SUCCESSFUL BIDDERS* CHOOSE HD-19's for Major Projects...

Now The New Jersey Turnpike

EVEN FLOW OF POWER means smooth, fast loading. Torque converter automatically synchronizes speeds of the HD-19's pulling and pushing — work as one! Starts and stops are made through throttle — no constant clutching, no sudden shocks to operator and equipment on pusher contacts.

SPEEDS BULLDOZING. Bigger loads are rolled faster . . . load, terrain and use of throttle govern forward speed — and there's no stalling of engine! High reverse gets HD-19 back for each pass quicker. No job is too tough to handle with its ground-gripping traction and heavy, correctly balanced weight.

Big Fleets of New Torque
Every Grading Contractor

Some of the reasons big, rugged HD-19's are preferred—

HYDRAULIC TORQUE CONVERTER DRIVE eliminates most gear-shifting . . . keeps tractor working at higher average speeds . . . provides smooth, cushioned performance. Increases production, cuts maintenance costs.

EASIER, FASTER SERVICING through simple unit assembly. Major units can be removed and repaired or replaced without removing unrelated parts. Simpler construction throughout.

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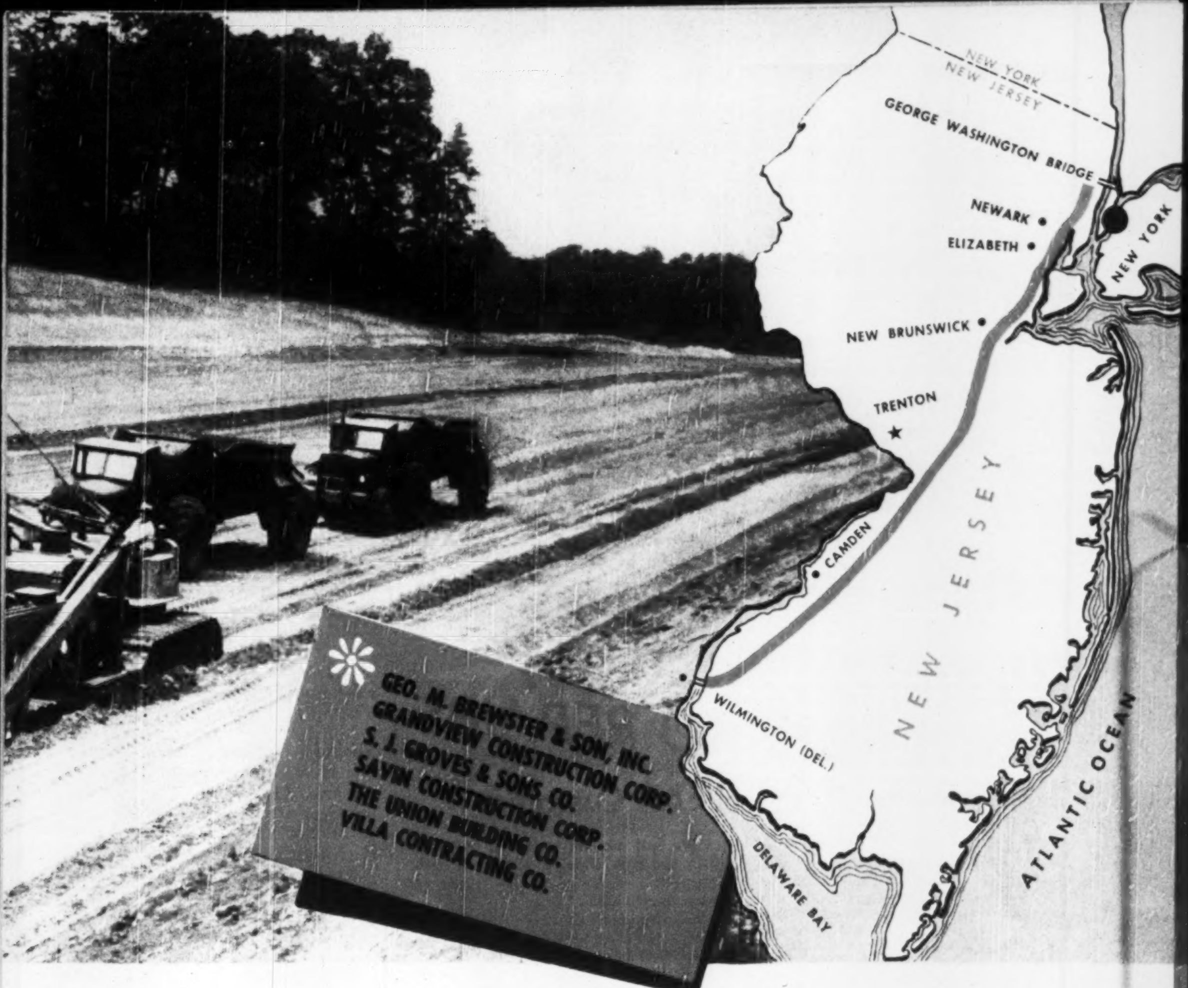
FOR GREATER PRODUCTION
FOR EASIER OPERATION
FOR SIMPLIFIED SERVICING


NEW YORK
NEW JERSEY
GEORGE WASHINGTON BRIDGE
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NEW YORK
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DELAWARE BAY
ATLANTIC OCEAN
GEO. M. BREWSTER & SON, INC.
GRANDVIEW CONSTRUCTION CORP.
S. J. GROVES & SONS CO.
SAVIN CONSTRUCTION CORP.
THE UNION BUILDING CO.
VILLA CONTRACTING CO.

Converter Tractors . . . Some Over 20 Units . . . are used by on this Outstanding 118-Mile, 40,000,000 cu. yd. Job

SIMPLIFIED MAINTENANCE AND LUBRICATION. All adjustments unusually accessible. All fittings or lubrication points readily reached — none under tractor. Extended lubrication periods—1,000 hours on truck wheels, track idlers and support rollers.

FULL OPERATOR COMFORT. With gear-shifting practically eliminated and hydraulic fingertip steering, operator's job is much easier — fatigue is cut, output goes up. Many other operating advantages.

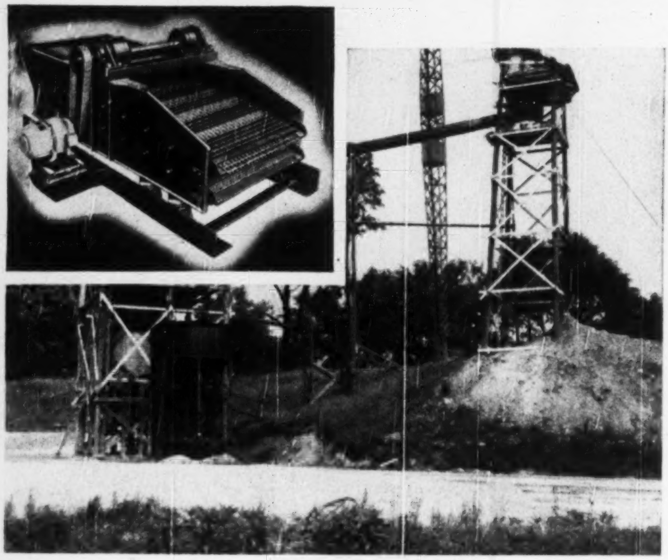
RUGGED, DEPENDABLE. 40,000 lb. of properly balanced weight . . . long, wide, sure-gripping tracks — a powerful, heavy tractor that really "bears down" . . . outperforms and outlasts under any operating conditions.

• • •

On any job . . . big or small . . . tough or easy . . . you will cut costs, increase profits with powerful HD-19 Hydraulic Torque Converter Tractors. "Seeing is Believing." Ask your Allis-Chalmers dealer for a demonstration.

ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

Originator of the Torque Converter Tractor



"Premium Accuracy With NO REPAIRS . . . Made us a REPEAT Customer"

• When Routh Gravel Plant, Zionsville, Indiana, re-located and built a new and modern plant, the screen they added was another Deister.

And no wonder, for their first four-deck Deister Vibrating Screen graded small sizes with *premium* accuracy, with no repairs in more than five years.

Paul N. Routh, plant owner, says:

"Accurate grading of small sizes, and flexibility for blending, is the essential feature of our plant, for we sell principally to the producers of concrete block and tile.

"We found the *four-deck* 3 x 8 Deister Screen we purchased five years ago answered both those problems, and we have yet to make that first repair aside from normal cloth replacement.

"We still use this screen in our new plant and have added a 3 x 6 two-deck Deister for scalping and one grade of coarse road ballast."

Routh produces six sizes of gravel, two sides of sand, employing a split bottom deck—5/32 and No. 4 screen—on the bottom deck of the four-decker, with a blending table below, to give maximum flexibility at minimum cost.

For accurate grading, for flexibility, for *years* of trouble-free operation—in other words for top production at less cost—specify Deister Vibrating Screens with the patented elliptical throw and two-bearing suspension. For complete information, ask for Bulletin No. 50.

DEISTER SCREENS

DEISTER MACHINE CO.
FORT WAYNE 4, INDIANA

OBITUARY

Ernest A. Herrick, 91, retired construction engineer, died at Gardiner, N. Y., Aug. 25. A charter member of The Moles, he was president of the Oakdale Construction Co. and of the Cornell Construction Co., both of New York. He was with Dignon Construction Co. as general superintendent on Belmont Tunnel, now Queensboro subway, and on Wallkill pressure tunnel, Catskill Aqueduct. He had worked on approaches to the George Washington and Perth Amboy bridges.

Oliver G. Taylor, 66, chief of public services of the National Park Service and a civil engineer, died Aug. 26 in Chevy Chase, Md. Mr. Taylor was chief engineer of the National Park Service, 1937-43 and 1944-45. In 1944 he was regional director of the Services' Region One, headquarters in Richmond, Va. He was made Chief of Public Services in 1945. Mr. Taylor joined the Geological Survey in 1909, returning to it in 1919 after World War I service as a captain. In 1920 he was named resident engineer in Yosemite National Park, Calif.

Michael J. McGinty, 84, who built the first railroad into Oklahoma, died at Minerva, Ohio, Aug. 28. He was president of the former McGinty Construction Co., which built levees on the Mississippi River, more than 8,000 miles of highways and several hundred miles of railroad. In the first World War he was a construction advisor for the federal government.

J. Perry Shumaker, 60, first city planning engineer of Columbus, Ohio, died Aug. 27. A graduate of Purdue, he had been central Ohio division engineer. He recently revised the Columbus building code, and had done much to develop a far-reaching planning program for the city.

Harry M. Glassmire, 74, an assistant city engineer in Buffalo, N. Y., for more than 30 years and an employe of the Buffalo Public Works Department for 48 years, died Aug. 24. He retired in 1946. In 1931 he was instrumental in adoption of a skin-patching method of pavement repair, replacing the old system of chopping out holes before repaving. He was credited with saving the city more than $1,000,000 in paving repairs over a 15-year period through use of this method.

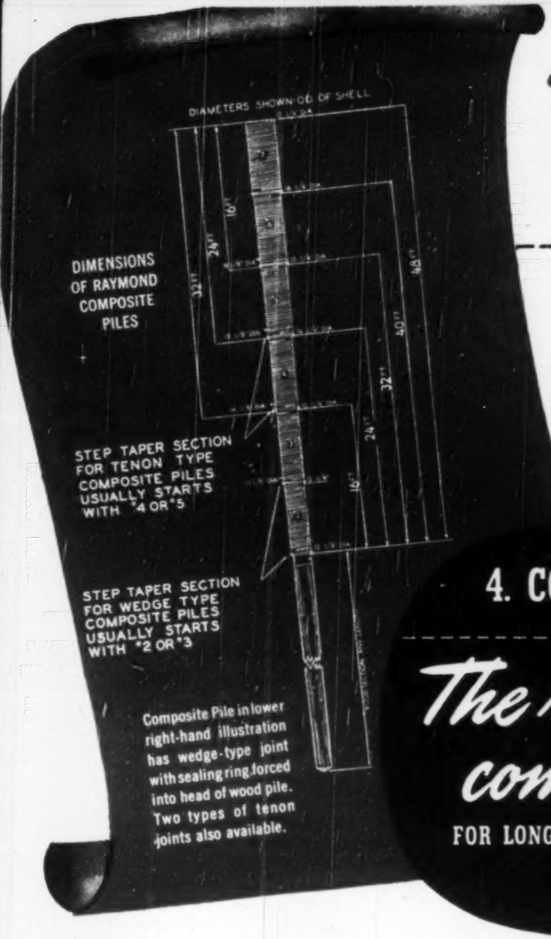
George E. Solnar, Jr., 37, civil engineer and manager of the Clay Brick and Tile Manufacturers Association at

(*Continued on page 81*)

Raymond MAKES 5 TYPES OF CONCRETE PILES

1. STANDARD . . . 2. STEP-TAPER . . .
3. PIPE STEP-TAPER . . . 4. COMPOSITE
5. GOW CAISSONS

Raymond installs every type of pile: cast-in-place concrete, precast concrete, steel pipe, wood and H-beam. Raymond operations include underpinning, borings and soil investigations, waterfront construction and harbor and river improvements, also cement mortar lining of pipes by the Centriline Corporation, a Raymond Subsidiary.


DIAMETERS SHOWN O.D. OF SHELL
DIMENSIONS OF RAYMOND COMPOSITE PILES
16FT
24FT
32FT
48FT
40FT
32FT
24FT
16FT
STEP TAPER SECTION FOR TENON TYPE COMPOSITE PILES USUALLY STARTS WITH #4 OR #5
STEP TAPER SECTION FOR WEDGE TYPE COMPOSITE PILES USUALLY STARTS WITH #2 OR #3

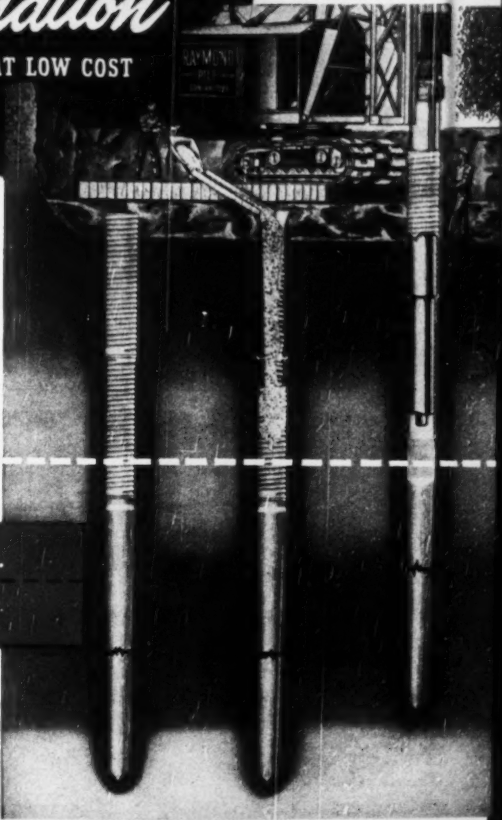
Composite Pile in lower right-hand illustration has wedge-type joint with sealing ring forced into head of wood pile. Two types of tenon joints also available.

4. COMPOSITE PILES

The right combination

FOR LONG LENGTH AT LOW COST

Right, driven wood pile is being followed down by pile shell of concrete section. Center, complete pile driven to resistance, pile shell is being filled with concrete. Joint, wedge-type with sealing ring, is below ground-water level. Completed pile is shown at left.



Raymond Composite Piles are used for economy and long length. The concrete upper section extends from the permanent water table up to the underside of the footing, thus eliminating the expensive excavation, sheeting and pumping often required with wood piles.

Raymond Composite Piles have solved many deep foundation problems permanently and at minimum final cost. We shall be glad to advise you, without obligation, whether they are suitable for your project.

PERMANENT WATER LINE

RAYMOND PILES MAINTAIN DRIVING RESISTANCE

Raymond CONCRETE PILE CO.
140 CEDAR STREET, NEW YORK 6, N. Y.

BRANCH OFFICES: Boston, Syracuse, Philadelphia, Baltimore, Washington, Pittsburgh, Atlanta, Miami, Houston, Kansas City, St. Louis, Cleveland, Chicago, Detroit, Salt Lake City, Portland, San Francisco, Oakland, Los Angeles and principal cities in Latin America.

In a City of Beautiful Buildings

Celotex Roof Insulation is proving itself where it counts most: ON THE JOB!

KASS BUILDING, WASHINGTON, D. C.

specified Celotex Roof Insulation

Architect: James F. Hogan

Roofing Contractor: Easterday-Duckworth Company
Owner and Builder: Kass Realty Company, Inc.

Only the finest of materials were specified for the ultra-modern Kass Building — one of the newest office buildings in the nation's capital. Among these, naturally, was Celotex Roof Insulation.

There's a type of Celotex Roof Insulation for every job

REGULAR — for efficient insulation at lowest cost.

PRESEAL — with asphalt coating for extra moisture protection.

PRESEAL "30" — with asphalt coating; special low density core; guaranteed 0.30 conductance for nominal 1" thick material before coating.

VAPOR-SEAL — with asphalt coating; guaranteed 0.30 Btu conductance for nominal 1" thick material before coating; and patented recessed edges that form channels which help prevent roof blisters by equalizing the pressure of air trapped under roofing.

In roof insulation, as in everything else, *the payoff is in performance!* And no other roof insulation can challenge the *job-proved* record for quality, durability and economy set by Celotex Roof Insulation through over 25 years of actual use in all types of installations, all over the country.

Celotex Roof Insulation is low in initial cost, easy to handle, exceptionally durable. It speeds application, reduces labor costs, helps assure a superior, long-lasting roof that requires less maintenance.

So why take risks with untried materials? For complete satisfaction, always specify Celotex Roof Insulation. There's a type to meet every job requirement. Write now for complete technical data! The Celotex Corporation, Dept. EN-90, Chicago 3, Illinois.

1. High Insulating Efficiency means greater comfort the year 'round, plus reduced heating and air conditioning costs.

2. Low in Cost all three ways: initial, applied, maintenance.

3. Quick, Thrifty to Apply: installed with less time, work and cost because it's light and easy to handle. Strong and rigid—doesn't have to be "babied" on the job.

4. Provides Excellent Bond for hot mopped roofing felts of either the asphalt or coal tar pitch type.

5. Durable, Long-Lasting. It is the *only* roof insulation made of long, remarkably strong Louisiana cane fibres—and protected by the *exclusive* patented Ferox® Process against dry rot, fungus and termites.

Only Celotex Roof Insulation offers all these advantages

It pays to specify genuine

CELOTEX

REG. U. S. PAT. OFF.

ROOF INSULATION

The Celotex Corporation
Chicago 3, Illinois

San Francisco, died Aug. 3 while on a camping trip in the high Sierras. He was a graduate of Stanford University.

Joseph A. Adam, 62, for the last 40 years a civil engineer with the Department of Public Works at Montreal, died Aug. 24. He was a graduate of McGill University.

O. Weimer Birkinbine, 56, a consulting engineer, died on Aug. 20 at Philadelphia, Pa. He headed the Birkinbine Engineering Co. He attended the University of Pennsylvania. He had done engineering work on numerous roads and dams throughout Pennsylvania, and had aided in the engineering construction of the Manhattan Project, Oak Ridge, Tenn.

William Hodgkins, 83, a building contractor in Niagara Falls, Ont., for more than 50 years, died Aug. 21.

Chester T. Morey, 67, consulting engineer in the U. S. Department of Labor office, Providence, R. I., died Aug. 28 in Belmont, Mass.

Benjamin J. Finman, 46, former city engineer of Tampa, Fla., died there Aug. 26. He was a graduate of the University of Florida.

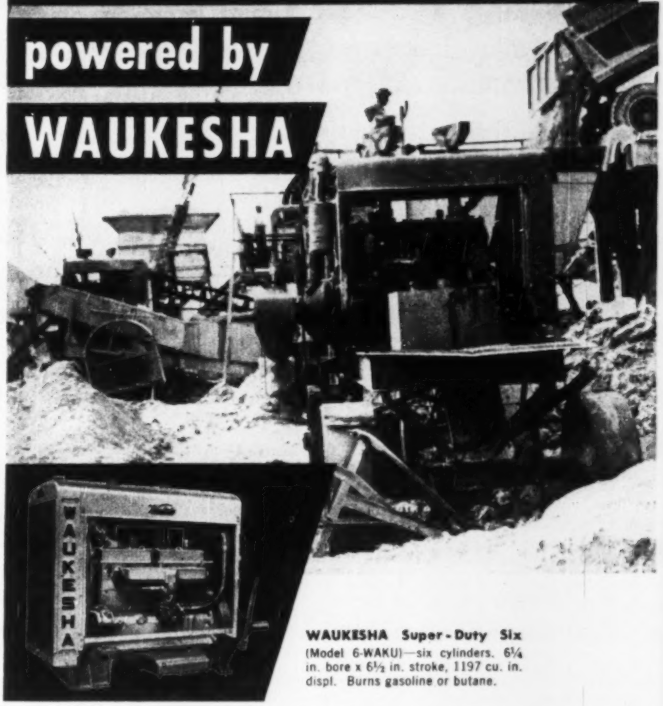
E. Morton Fleming, 61, assistant director of public relations of the N. Y. State Department of Public Works, died at Mt. Kisco, N. Y., Aug. 30. He had lived in Albany and had been in his Public Works position since May, 1949. He was a C. E. Graduate of the University of Pennsylvania. Prior to joining the state service he had been with the Portland Cement Association as eastern district manager in New York for 15 years.

Shadrach C. Draper, 77, retired superintendent of bridges and buildings for the Illinois Central Railroad, died Aug. 31 in Chicago. He was retired in 1943 after 50 years with the railroad and later made his home in Omaha, Neb. His headquarters as superintendent was in Clinton, Ill.

Henry A. McClean, 78, for many years an engineer-architect at Providence, R. I., died at West Warwick, R. I. Sept. 4. For some years he was with C. R. Makepeace Co., Providence, but from 1928 to 1944 he ran that business under his own name, following its purchase. He retired in 1944.

◆

County master plan—The planning board of Erie County, N. Y., expects to prepare a master plan for the future development of the county, of which Buffalo is the countyseat.



ARUNDEL CORP. gravel plant powered by WAUKESHA

WAUKESHA Super-Duty Six (Model 6-WAKU)—six cylinders. 6¼ in. bore x 6½ in. stroke, 1197 cu. in. displ. Burns gasoline or butane.

● This is one of the Arundel Corporation's sand and gravel plants, near Washington, D. C. Its Pioneer equipment is Waukesha powered for more tonnage . . . faster . . . at low power cost per ton. And for trouble-free operation. That's how to turn out tonnage profitably.

The two power units in this picture are Waukesha Super-Duty Sixes (Model WAKU). That's the tough-to-take-it type—protected against dust and dirt—and rugged all the way, from oil pan to head. Most modern . . . in construction . . . in design . . . for most power per cubic inch displacement. It puts out 225 hp. at 1600 r.p.m. Easily! Eagerly! Efficiently!

Economical to operate. And easily serviced. An overhead valve engine—you just remove the heads and grind the valves wherever it's convenient. Each cylinder is a wet sleeve casting, easily removed from the main case and renewed. Tell you more? All right, send for Bulletin 1139.

Waukesha Motor Company, Waukesha, Wis.
NEW YORK • TULSA • LOS ANGELES

WAUKESHA
POWER UNITS

Built and Installed

By People Who Know How

Let's be quite frank about what it takes to build a completely satisfactory, long-lasting Well Water System. As an almost entirely underground construction job, there must be a lot of know how; skill and experience gained over a long period of years in the building of thousands of Well Water Systems, otherwise many costly errors may be made.

In all the world, there is no firm that equals Layne in skill; none that has had so much experience and none that is known to be so successful. Layne has built many successful systems where others have failed, proving that skill was the needed factor.

Layne constructs perhaps more big Well Water Systems than any other firm in the Nation. In addition to skill, Layne can offer the finest types of equipment, some cf which they build for their exclusive use.

LAYNE & BOWLER, INC.
General Offices, Memphis 8, Tenn.

LAYNE
WELL WATER SYSTEMS
VERTICAL TURBINE PUMPS

ASSOCIATED COMPANIES: Layne-Arkansas Co., Stuttgart, Ark. • Layne-Atlantic Co., Norfolk, Va. • Layne-Central Co., Memphis, Tenn. • Layne-Northern Co., Mishawaka, Ind. • Layne-Louisiana Co., Lake Charles, La. • Louisiana Well Co., Monroe, La. • Layne-New York Co., New York City • Layne-Northwest Co., Milwaukee, Wis. • Layne-Ohio., Columbus, Ohio • Layne-Pacific, Inc., Seattle, Wash. • The Layne-Texas Co., Ltd., Houston, Texas • Layne-Western Co., Kansas City, Mo. • Layne-Minnesota Co., Minneapolis, Minn. • International Water Corporation, Pittsburgh, Pa. • International Water Supply, Ltd., London, Ont., Can. • Layne-Hispano Americana, S. A., Mexico, D. F. • General Filter Company, Ames, Iowa

UNIT PRICES BID BY CONTRACTORS

Airport improvements at McAlester, Okla.

Runway paving and improvements to McAlester, Okla., Municipal Airport brought a low bid of $191,199 July 24, 1950. It was 18.3% below the engineer's estimated $233,968, 1.7% below the second low bid and 24.4% below high. Six of the seven bids received were below the estimate. C. C. Pate Engineering Co., of Tulsa, Okla., is engineer.

The work involves grading 80,000 cu. yds. of runway and administration area, paving 100x4000-ft runway, taxiway and apron, installing drainage pipes and fencing the entire project. The contractor furnishes all labor, materials and equipment. The job site is 1 mile southeast of the city of McAlester on U.S. route 69 and ½ mile from the Missouri-Kansas-Texas Railroad.

Work was started August 21 and is scheduled for completion Feb. 21, 1951. The prevailing wage rates are: unskilled laborers, $1.00; pipe layers, $1.15; power equipment operators range from $1.50 to $2.25; truck drivers range from $1.20 to $1.45; mechanics, $1.50; cement finishers, $2.00. Bidders include:

1	J. Briscoe, Stillwater, Okla., (contract)	$191,198.60
2	Southwest General Construction Co., Dallas, Tex	194,425.22
7	Amis Construction Co., Oklahoma City, Okla	252,651.00
	Engineer's estimate	233,968.00

		Quan-	Unit Prices	
Items		tity	1C	2
Clearing	ls	......	$1,000	$800.00
Excav, uncl	cy	80,000	.32	.33
8" conc pav	sy	15,180	3.00	3.07
7" conc pav	sy	33,330	2.70	2.70
24" conc drain pipe	lf	867	5.00	5.05
18" conc drain pipe	lf	590	4.00	3.55
15" conc drain pipe	lf	1,040	3.60	2.80
Catch basins	ea	8	190.00	215.00
Headwalls	cy	1.66	60.00	72.00
3" conc encased duct, 4-way	lf	240	1.00	3.05
Grav base entr rd, park area	cy	1,100	3.75	3.60
Bit matl, 1st appl	gal	2,200	.25	.18
Bit matl, 2nd appl	gal	1,350	.25	.18
Agg, 1st course	T	82	5.00	3.85
Agg, 2nd course	T	41	5.00	3.85
Fence, woven wire	lf	12,700	.24	.27
Fence, 4-strnd barb	lf	2,150	.19	.16
Cattle guards	ea	3	650.00	995.00
Gate	ea	1	75.00	75.00
Excav, access rd	cy	5,000	.32	.33
Grav surf, acc rd	cy	1,000	2.75	4.00
24" corg metal culv	lf	90	4.00	3.80
30" corg metal culv	lf	92	5.00	4.65
Bit matl, prime ct	gal	2,000	.25	.18

Soil stabilization, Md.

Only two bids were received July 5, 1950, by the Maryland State Roads Commission on soil stabilization and surface treatment, Somerset Co. The bids were $391.50, or 2%, apart.

The work, including scarifying, reshaping, stabilization and bituminous surface treatment, is located along the Rehobeth-Pocomoke Road, beginning 1¼ miles north of Rehobeth and extending northeasterly for a distance of 1.999 miles. It is about 6 miles from a railhead. The job started July 22, is to be completed by Oct 22.

Minimum wages are: skilled labor, $1.75 an hour; semi-skilled, $1.25; common, $0.75. Bidders were:

1	Waller Paving Co., Salisbury, (contract)	$19,428.00
2	Hannaman Burroughs, Salisbury	19,819.50

		Quan-	Unit Prices	
Items		tity	1C	2
Scar, reshape exist rdway	lf	10,555	$.10	$.10
Agg for stab soil bs using No. 3 stone	T	1,875	5.35	5.88
Agg for surf treat, No. 3 & 4 stone	T	775	5.35	5.88
Bit matl for surf treat	gal	21,300	.15	.14
Maint traffic	ls	......	1,000	200.00

The contractors bid also on a slag alternate with a 7.4% difference between bids.

1	Waller Paving Co	$19,482.50
2	Hannaman Burroughs	21,037.50

		Quan-	Unit Prices	
Items		tity	1	2
Scar, reshape rdway	lf	10,555	$.10	$.10
Agg, soil st, #3 slag	T	1,700	5.93	7.00
Agg, sur tr, #3 & 4 slag	T	700	5.93	7.00
Bit matl, sur tr	gal	21,300	.15	.14
Maint traffic	ls	......	1,000	200.00

Russell, Kan., improves water distribution

Five of the six bids on the water distribution system improvements in Russell, Kan., were below the engineer's estimated $89,975, July 12, 1950. The low bid, at $85,715, was 4.2% below the estimate, 1.5% below the second low and 5.2% below the high bid. Wilson and Company, of Salina, are engineers.

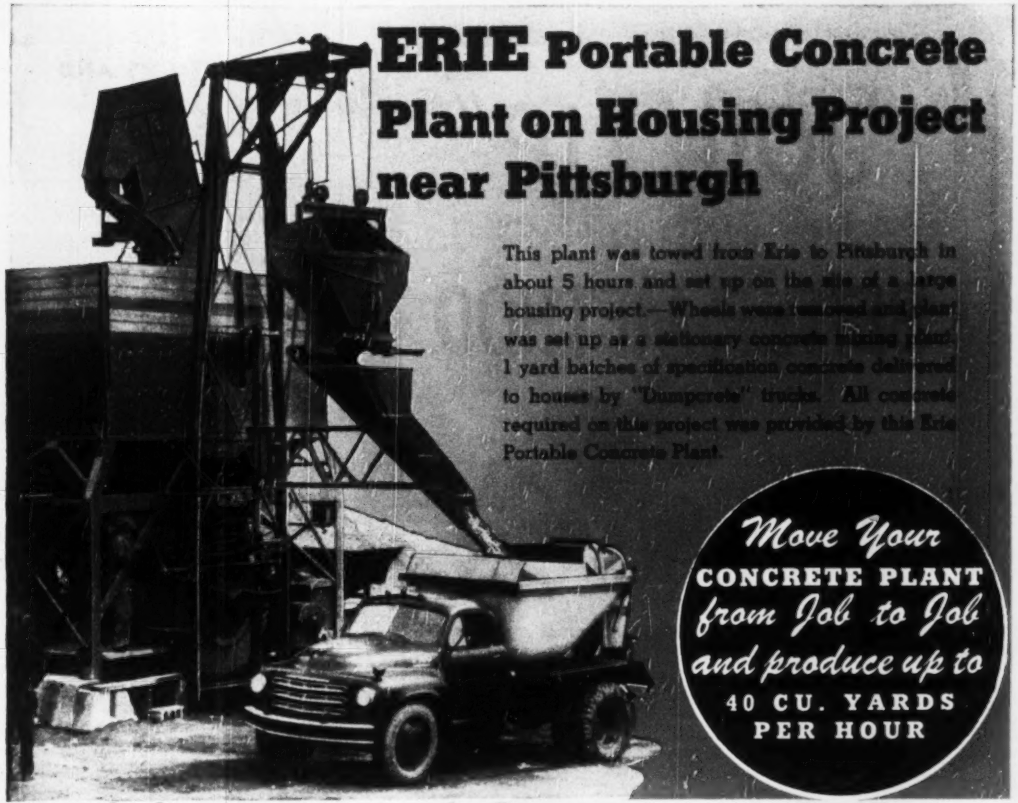
The work involves furnishing all equipment, materials and labor for trenching and backfilling, cast iron pipelines, fittings, valves, fire hydrants, connections to existing system and removal and replacement of facilities interfering with construction.

Highway and rail facilities are within 1 to 2 miles of the job site. Work was commenced Sept. 1 and must be completed by Jan. 1. Wage rates prevailing are $1.50 per hour for skilled workers and $1.00 for unskilled.

Bidders include:

1	Burt & Binford, Hutchinson, Kan (contract)	$85,715.00
2	Grundeman Const. Co., Holton	87,030.00
6	Hughes-McCollum Const. Co., Garden City, Kan	90,385.50
	Engineer's estimate	89,975.00

		Quan-	Unit prices	
Items		tity	1C	2
Pipeline, cast iron 12"	lf	5,700	$5.50	$5.50
8"	lf	6,950	3.60	3.50
6"	lf	800	2.80	2.75
4"	lf	4,750	1.95	2.00
Fittings, cast iron	T	9	390.00	350.00
Gate valve & box 12"	ea	3	225.00	230.00
8"	ea	14	125.00	100.00
6"	ea	3	75.00	60.00
4"	ea	17	62.50	50.00
Fire hydrant, 6", 3-way	ea	1	190.00	225.00
4", 2-way	ea	2	145.00	175.00
Brick or bit pav, rem & repl	sy	300	7.00	8.00
Curb, gutr, rem & repl	lf	50	2.00	2.00
Sidewalks, rem & repl	sf	1,100	.40	.60
Con to exist sys	ea	30	175.00	220.00
Conc encas of sewer lines	cy	10	15.00	25.00
Conc pav, saw, rem & repl	sy	350	6.00	8.00

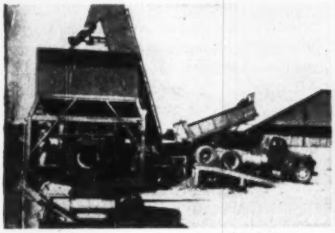


ERIE Portable Concrete Plant on Housing Project near Pittsburgh

This plant was towed from Erie to Pittsburgh in about 5 hours and set up on the site of a large housing project.—Wheels were removed and plant was set up as a stationary concrete mixing plant. 1 yard batches of specification concrete delivered to houses by "Dumpcrete" trucks. All concrete required on this project was provided by this Erie Portable Concrete Plant.

Move Your **CONCRETE PLANT** *from Job to Job and produce up to* **40 CU. YARDS PER HOUR**

In Illinois

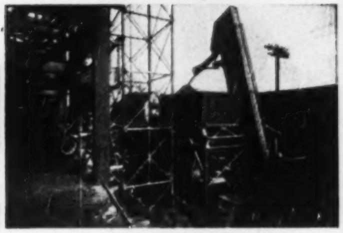


This Erie Portable Concrete Plant, electric motor driven, is set up in a town of 10,000 population to supply concrete within a 16 mile radius. Steam heating makes it possible to operate all year and sales up to 100 yards a day are recorded without taxing the full capacity of the plant.

In Transit

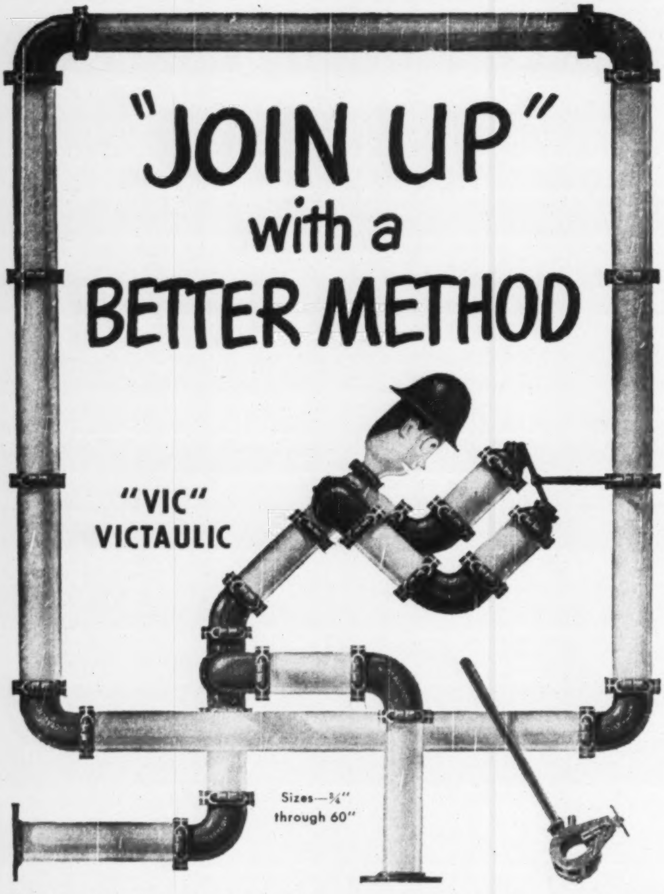
The above Erie Portable is being towed 100 miles to make concrete on a series of building projects. 2 men can get it into operation within 60 minutes and it can be "knocked down" for towing in less time. Booklet SP1 gives complete specifications. Write for copy.

In New York



This Erie Portable Concrete Plant is completing here a 6000 cu. yard concrete job and has since been moved to three building sites in Buffalo. Consult with Erie for complete details on the Erie Portable Concrete Plant as applied to your concrete project.

ERIE
STEEL CONSTRUCTION COMPANY
109 GEIST ROAD • ERIE, PENNSYLVANIA



The VICTAULIC METHOD of piping can save you time, work, and dollars on construction and maintenance *right down the line.*

When you "join up" with the VICTAULIC METHOD you are assured of easy, quick, and dependable pipe connections. Pipe ends are "hooked up" in a jiffy with Victaulic couplings – only two bolts to tighten with a standard T-wrench! Victaulic pipe joints stay positive-locked, leak-proof . . . they are built to stand up under extreme pressure, vacuum or strain conditions!

Grooving those pipe ends is a cinch with the VICTAULIC METHOD . . . "Vic-Groover" grooves 'em automatically in half the time of a conventional pipe threader!

AND Victaulic offers a complete line of Full-Flow Elbows, Tees, and other Fittings designed for free-flowing efficiency . . . giving complete versatility and dependability to the VICTAULIC METHOD.

"JOIN UP" with the COMPLETE VICTAULIC SYSTEM – a *better method* for efficient piping construction . . . and the EASIEST WAY TO MAKE ENDS MEET.

* * *

Make *your* next piping job ALL VICTAULIC. Write today for these two: Victaulic Catalog and Engineering Manual No. 44, "Vic-Groover" Catalog No. VG-47.

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26TH VICTAULIC YEAR

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The easiest way to make ends meet
VICTAULIC
PIPE COUPLINGS AND FITTINGS

ELECTIONS AND ACTIVITIES

The group of professors and scientists who a few years ago decided to spend their summer vacations studying hydraulic problems in pleasant surroundings, and built the Rocky Mountain Hydraulic Laboratory at Allenspark, Colo., for the purpose, held their fifth annual meeting Aug. 19. A program of five papers was presented, and some 40 persons were in attendance. Colorado, Wyoming, Utah, Texas, Iowa and Washington, D. C., were represented. Papers were devoted to such subjects as well screen performance, unconfined flow to wells, hydraulics in highway engineering, bridge pier scour (ENR May 25, 1950, page 43) and unsteady flow in open channels. Arrangements were in charge of Chesley J. Posey, acting head, department of civil engineering, University of Iowa.

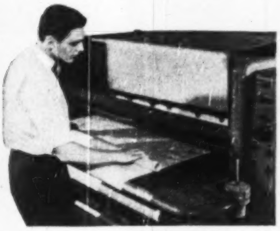
Massachusetts city managers have formed an association headed by John B. Atkinson, city manager of the Bay State's model E plan city, Cambridge. In New England there are city manager groups in Maine, Connecticut, and New Hampshire. All these belong to the International City Managers Association headquarters, Chicago. Manager-type cities and towns now represent 25 percent of Massachusetts. Managers are now employed in Cambridge, Danvers, Lowell, Mansfield, Medford, Middleboro, Norwood, Quincy, Revere, Saugus, Stoughton, and Worcester. Other towns and cities have voted for this plan.

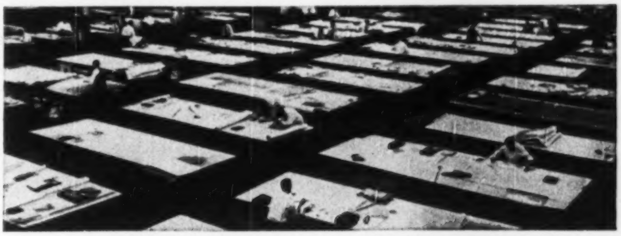
More than 75 sewage plant operators, supervisors and maintenance workers attended the recent annual sewage works school of the North Carolina Sewage Works Association at Durham, N. C. Held at the Duke University School of Engineering, with the cooperation of the North Carolina State Board of Health and the North Carolina League of Municipalities, the school featured laboratory sessions, field trips to nearby sewage plants, and lectures by sewage experts. Those who served on the faculty in addition to members of the Duke faculty, public health officials and industrial experts, included: W. H. Wisely, executive secretary of the Federation of Sewage Works Associations; H. P. Nicholson, biologist, who lectured on stream pollution; F. W. Kittrell, chief of the

(*Continued on page 86*)

A $75,000 per year saving in the making . . .

Streaming off this continuous processing machine at the Ford Motor Company . . . are Kodagraph Autopositive prints—positive photographic intermediates of original drawings. *The answer to a $75,000 per year redrafting headache!*





Before . . . Ford's valuable original drawings had a short life . . . had to do double duty in the drafting room and in heavy print production. In the latter operation, they were exposed to machine wear and tear, constant handling. Soon they lost their detail . . . produced illegible blueprints . . . which meant that new drawings had to be ordered from the drafting room.

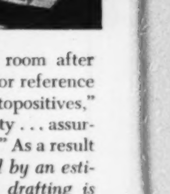
Now . . . Ford's originals are filed away in the drafting room after Kodagraph Autopositive intermediates are made—available for reference and revisions only! All blueprints are produced from the "Autopositives," whose photographic black lines will not smudge or lose opacity . . . assuring highly legible prints even after hundreds of "run throughs." As a result of this simple change in routine, *redrafting costs are reduced by an estimated $75,000 per year . . . while the output of creative drafting is increased.* And print production is simplified, too . . . for Kodagraph Autopositives are not only longer-lasting . . . but can be printed at uniform, practical machine speeds.

Kodagraph Autopositive Paper

"The Big New Plus" in engineering drawing reproduction

You, too, can cut your drafting costs, get improved legibility, and simplify print production . . . by reproducing your drawings on this new, low-cost photographic intermediate paper.

You can turn out "Autopositives" quickly, economically . . . with your present print-making equipment and standard photographic processing. Or else you can order them from your local blueprinter. *It will pay you to get all the facts soon!*



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MAIL COUPON FOR FREE BOOKLET

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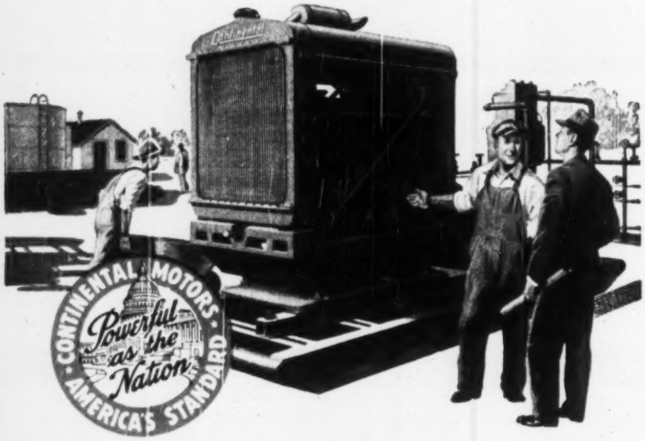
RED SEAL POWER

In choosing power equipment there are two things to keep in mind:

(1) The closer the engine matches the job it has to do, the better its performance, and the lower your costs. (2) Whatever your specific need, there's a Continental Red Seal engineered to meet it—not approximately, but "right on the nose."

You'll find Continental in leading makes of construction and industrial equipment, powering generators, mixers, winches, hoists, cranes, and many other types of machines. Models range all the way from the six-cylinder overhead-valve S-6749—developing 141.3 h.p. for continuous duty—down to the ¾-1 h.p. air-cooled AC5, lately added to the line. Between these extremes, some 40 different models are available, built to literally hundreds of specifications, to match them PRECISELY to the needs of countless different jobs. For maximum reliability, choose equipment with Red Seal power. And for separate power units engineered to your specific needs, see your Continental dealer.



PARTS AND SERVICE FROM COAST TO COAST

Continental Motors Corporation
MUSKEGON, MICHIGAN

Stream Sanitary Staff of the Tennessee Valley Authority, who discussed "Case Histories of Industrial Waste Problems"; and Miss Gladys Swope, chemist with the Argonne National Laboratory of the Atomic Energy Commission, who conducted classes on industrial waste problems.

CALENDAR

Convention of Roadmasters' and Maintenance of Way Association, and the **American Railway Bridge and Building Association,** Hotel Stevens, Chicago, Ill., Sept. 18-20.

New England Water Works Association, Poland Springs, Me., Sept. 18-21.

American Society of Photogrammetry, Harvard University, Cambridge, Mass., Sept. 21-22.

Building Research Advisory Board—Research correlation conference, National Academy of Sciences, Washington, D. C., Sept. 26.

Pennsylvania Water Works Association, Claridge Hotel, Atlantic City, N. J., Sept. 26-29.

Rocky Mountain Sewage Works Association, La Fonda Hotel, Santa Fe, N. M., Sept. 27-29.

South Dakota State Association of County Commissioners, Auditors, Highway Superintendents and State Highway Officials, annual convention, Cataract Hotel in Sioux Falls, Sept. 28-30.

Pacific Coast Building Officials Conference, Manor Hotel, San Diego, Calif., Oct. 3-6.

National Council of State Boards of Engineering Examiners, Congress Hotel, Chicago, Ill., Oct. 9-11.

ASCE, fall meeting, Congress Hotel, Chicago, Ill., Oct. 11-14.

Structural Engineers' Association of California, Hotel Del Coronado, Coronado, Calif., Oct. 12-14.

S. W. section AWWA, Roosevelt Hotel, New Orleans, La., Oct. 15-18.

Public Works Congress and Equipment Show, 9th Regiment Armory, New York City, Oct. 15-18.

Water conference, Engineers' Society of Western Pennsylvania, Hotel William Penn, Pittsburgh, Pa., Oct. 16-18.

National Association of Housing Officials, Detroit, Mich., Oct. 16-19.

National Conference on Industrial Hydraulics, Sherman Hotel, Chicago, Ill., Oct. 18-19.

Pennsylvania section, AWWA, Roosevelt Hotel, Pittsburgh, Pa., Oct. 18-20.

Engineers' Council for Professional Development, Tudor Arms Hotel, Cleveland, Ohio, Oct. 20-21.

National Public Health Engineering Conference, University of Florida, Gainsville, Oct. 23.

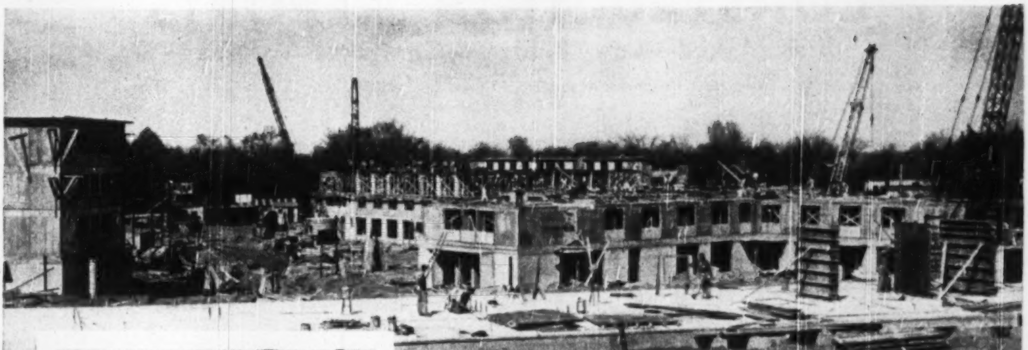
Structural Clay Products Industry, Broadmoor Hotel, Colorado Springs, Colo., Oct. 23-26.

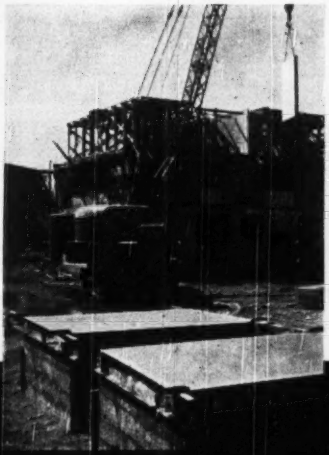
American Institute of Steel Construction, Shamrock Hotel, Houston, Tex., Oct. 23-26.

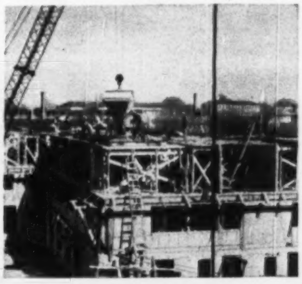
American Concrete Institute, Mayflower Hotel, Washington, D. C., Oct. 24-26.

California section, AWWA, U. S. Grant Hotel, San Diego, Calif., Oct. 24-27.

Carolinas Branch, A.G.C., White Sulphur Springs, W. Va., Oc. 30-31.







UNIVERSITY OF CONNECTICUT'S UNIQUE DORMITORY DESIGN

•Dormitories are built of precast concrete panels and reinforced concrete floors. Load bearing exterior and corridor panels support floors. All panels, including room partitions, are locked into place by floors and by spandrel beams around perimeter of buildings at each floor level. Exterior wall panels are veneered with cast stone to second floor and with brick above. Lower left photo: Method of casting corridor wall panels in stacks on the ground. Lower right photo: Exterior wall panels for each floor are precast on shoring deck for floor above.

Lost time regained . . . with LEHIGH EARLY STRENGTH CEMENT

When construction was started on the seven 4-story women's dormitories for the University of Connecticut, unfavorable fall weather was just beginning. Operations were hampered—job progress was slow. And winter weather was still ahead.

To complete the job on time, Frouge Construction Company, the contractors, stepped up their schedule with Lehigh Early Strength Cement. This is what happened: Lost time was soon made up . . . and because of the faster schedule, *form costs were cut by one-fourth, labor costs by one-third.*

Here are three examples of how Lehigh Early Strength Cement helped to make these time and cost savings: Exterior wall panels were ready to be dropped into position the day after they were cast. Corridor panels, cast in stacks on the ground, were ready to install when needed. Twenty-four hours after floors were poured, removal of shoring began. By the fourth day, all shoring was reset for the floor above, ready for installing partitions and casting exterior wall panels.

This actual case history proves again: You can save construction time—cut construction costs—with Lehigh Early Strength Cement. Our Service Department will be glad to help you with your specific problems.

THE JOB: Construction of seven 4-story Women's Dormitory buildings. Cost, $2,500,000.
LOCATION: University of Connecticut, Storrs, Conn. **OWNER:** State of Connecticut. **CONTRACTOR:** Frouge Construction Co., Bridgeport, Conn. **ARCHITECT:** McKim, Mead & White, New York City. **STRUCTURAL ENGINEER:** Fred N. Severud, New York City. **READY MIX CONCRETE:** General Sand & Stone Co., Elmwood, Conn. **PRECAST PARTITION PANELS:** Dura Stone Inc., Saylesville, R. I.

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CONSTRUCTION REPORTS

Bids Asked—Low Bidders—Contracts Awarded

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

ELSIE EAVES, Manager · *J. A. MAHONEY, Reports* · *M. R. ROESSLER, Statistics*

WATER SUPPLY

LOW BIDDERS

Minn., Lauderdale—Village, G. O. Gunderson, clk., 1739 Malvern Ave., St. Paul, August 21, WW. imprvs., from B. Carlone, 761 Jefferson Ave. St. Paul, **$68,622**. CD 8/10.

CONTRACTS AWARDED

Ala., Tuscaloosa—City, filter water basin, to Adams & Baker, Tuscaloosa, **$50,000**. CD 6/27.

▲ **Calif., San Francisco**—Public Utilities Comn., City Hall, 14.4 mi. San Joaquin Pipeline 2, Sect. A, Hetchy Contr. 230, Schedule 1, Sect. 1A and Schedule 3, Sect. A2 to P. & J. Artukovich, 13305 S. San Pedro St., Los Angeles, **$3,375,288*****Schedules II and IV, to United Concrete Pipe Corp., Box 425, Baldwin Park, **$3,386,221**. Bids 8/22 CD 8/29, under LB.

Fla., Jacksonville—City, City Hall, concrete foundations for one million gal. elevated water storage tank on Margaret St., to Girvin & White, 1226 W. Forsythe St., Zone 4, **$105,750**; 1 million gal. elevated water storage tank on Margaret St., to R. D. Cole Mfg. Co., Newnan, Ga., **$166,751**, est. $166,000. Bids 7/27, awarded 8/24. CD 7/11.

Ia., Prairie City—City, City clk., City Hall, water supply imprvs., Sec. A, 30,030 lin. ft. 4- to 6-in. c.i. pipe line, laid, valves and boxes, etc., to Joe Needles Greenfield, **$71,950**. Bids 8/7. CD 7/28.

Mass., Lynn—Commonwealth of Mass., M. D. C. Water Div., 20 Somerset St., Boston, Contr. 170, furnish and lay water pipes, to Pacella Bros., 63 Olney St., Dorchester, **$645,015**. Bids 8/17. Awarded 2/25. CD 8/4.

Tex., Abilene—City, Abilene, WW. imprvs., pumping unit to O. J. Simmons Co., Amarillo, **$37,815**. est. $40,000. Freese & Nichols, 407 Danciger Bldg., Fort Worth, engrs. Bids 7/28.

Tex., Fort Worth—City, City Hall, 8,160 lin. ft. 48 in. c.i. pipe line on Southside and appurtenances Contr. 1, to W. H. Nichols & Co. Inc., 3015 Grand St., Dallas, **$501,471**. Bids 8/10. CD 8/16, under LB.

Tex., Tyler—City, water treatment plant at Lake Tyler, to Lippert Bros. Inc., Box 3085, Oklahoma City, Okla., **$632,000**. Bids 8/22. CD 8/30, under LB.

Wyo., Cheyenne—Bd. P. Utilities, Cheyenne, water supply line to Lock Joint Pipe Co., 150 Rutledge Ave., East Orange, N. J., **$417,532**. Bids 8/17. Black & Veatch, 4706 Broadway, Kansas City, Mo., engrs. CD 5/16.

SEWERS, WASTE DISPOSAL

BIDS ASKED

Tex., Houston—Bids Asked—Meadowbrook Building, 7801 Howard Dr., storm sewers, $50,000; sanitary sewers, $60,000 Winkler, Howard Drives. G. T. Hutcherson and R. E. Bedell, 1212 Francis St., engrs.

LOW BIDDERS

O., Columbus—Franklin County Comrs., Courthouse, trunk sewer along Olentangy River Rd., Clinton Twp. connecting with Columbus main north bound sewer at Ohio State University and extending to near Bethel Rd. in northwest corner of Clinton Twp. from Thompson—Conie Const. Co., 1340 Windsor St. **$415,023**. Dessio T. Mitchel, county sanitary engr. CD 11/19/45.

CONTRACTS AWARDED

Ill., Chicago—Sanitary Dist. of Chicago, 910 S. Michigan St., Zone 5, sludge disposal works, interior work, addn., alteration, blower house and pump house, to Paschen Contractors, Inc., 2739 Elston Ave., Zone 47, **$934 804**. Awarded 8/24. CD 8/4.

Kan., Kansas City—City, sanitary sewers in Argentine Dist., to J. A. Tobin, 3700 Rainbow St., **$182,630**, Bids 8/15, J. O. Armstrong, city engr.

Kan., Udall—City, H. A. Kennedy, city clk., constr. sewage treatment plant, incl. 270 cu. yd. rein. con. screen chamber, Imhoff tank, dosing tank, sludge bed, intermittent sand filter 1,111 lin. ft. 8 in. c.i. pipe and sanitary sewer sys., 17,700 lin. ft. 8 in. virtrified clay pipe, etc., to Grundeman Constr. Co., Holton, **$88,864**. Bids 8/15. CD 8/8 under Udall, Neb.

Md., Rockville—Rockville City Council, 110 Commerce Lane, Contr. A 20,250 ft. 6 to 12-in. vitrified clay pipe, or rein. conc.-pipe 2250 lin. ft. 10 in. c.i. or steel pipe force main, manholes, etc., to F. O. Day Co., Old Georgetown Rd., Bethesda, **$108,775**. CD 7/14.

Mass., Brookline—Town, Bd. Selectmen, refuse incinerator, to Bossi Constr., Inc., 13 Leon St., Boston, **$718,524**. CD 8/22, under LB.

N. J., Camden—City, outfall sewer structure, bulkhead and fill work, to Progressive Builders Inc., Pennsauken, **$688,051**. Bids 7/19, CD 8/11, under LB.

BRIDGES

BIDS ASKED

New Jersey—B. A. 9/19—New Jersey Turnpike Auth., 65 Prospect St., Trenton,

Bergen Co.—constr. substructure and superstructures of the Bergen Turnpike Underpass and Route 6 overpass, Ridgefield Park. CD 7/13/49, under Streets and Roads.

† **N. C., Winston-Salem**—B. A. 9/19—At office Capt. W. T. Eckberg, Officer, Charge of Construction, Box 365, Naval Base, Charleston, S. C., improv. to bridge across Peters Creek Naval Industrial Reserve Ordnance Plant, NOY 21871, Spec. 24849. Plans deposit $5.

Pennsylvania—B.A. 9/19—Pennsylvania Turnpike Comn., 11 N. 4 St., Harrisburg,

Cumberland Co.—approach and exit lanes to and from Plainfield Service Station, West Pennsboro Twp.

Franklin Co.—approach and exit lanes to and from Path Valley Service Station, Metal Twp. Plans deposit $10. R. B. Stone, c/o owner, ch. engr.

Delaware—B.A. 9/21—Delaware State Hy. Dpt., Delaware Crossing Div., Continental American Bldg., Wilmington, Contr. No. 19, administration bldg., toll booths and toll collection equipment for "The Delaware Memorial Bridge" over the Delaware River near Wilmington. Plans deposit $25. Howard, Needles, Tammen & Bergendoff, 55 Liberty St., New York 5, N. Y., engrs.

LOW BIDDERS

Indiana—State Hy. Comn., Indianapolis, Aug. 29, grade separation, rein.-con. Columbia Ave., Hammond, Lake Co., from Arcole-Midwest Corp., Evanston, $277,663, est. $315,032**rein.-con. bridge over West Fork of White River, near Southport, Marion Co., from Smith & Johnson Inc., 1799 Kentucky Ave., Indianapolis, **$479,945**, est. $523,809***bridge over Paw Paw Creek east of Logansport, Cass Co., from Jno R. Gates, Springfield Ave., Fort Wayne, **$71,981**, est. $77,364 ***rein.-con. bridge over Thompson Ditch south of Terre Haute, Vigo Co., from G. H. Allen, 8 St., Vincennes **$58,293** est. $78,037. CD 8/8.

Maryland—State Rds. Comn., Baltimore, Zone 2, August 29, double leaf steel girder bascule span, 50 ft. channel, two flanking spans 59 ft. steel I-beam each, two 27 ft. roadways separated by 4 ft. median, bascule piers above bases for bridge over Kent Island Narrows on Stevensville-Queenstown Hy., Contr. Q 168-11-215, Queen Anne's Co., from McLean Contr. Co., 1301 Fidelity Bldg., Baltimore, **$537,129**. CD 7/19.

Missouri—State Hy. Comn., Jefferson City, August 25, two 37 ft., two 44 ft., one 55 ft. continuous I beam spans, Sta. 467 plus 16 over G. M. and O. R.R., Rte. 40, road from east and west of Odessa, Proj. F G I 228 (6), from Cameron Joyce & Co., 19 S. 7 St., Keokuk, Ia., **$78,902**. CD 8/17.

▲ **New Jersey and Pennsylvania**—Delaware River Joint Toll Bridge Comn., Broad St. Bank Bldg., Trenton, N. J., Aug. 31, highway bridge and approaches, from Trenton, Mercer Co., N. J. to Morrisville, Bucks Co., Pa., from Dravo Corp., Neville Island, Pittsburgh, Pa., **$2,136,298**. CD 9/11.

North Dakota—State Hy. Dpt., Bismarck, Aug. 25, structural and incidental 0.036 mi. St. Hy. 18, south of Hoople, Proj. ER-S-39 (4), Walsh Co. from The Milton Rue Co., Bismarck, **$59,949*****structural; grading, gravel surf. and incid. 0.56 mi. Proj. S-390 (11), McHenry Co. from Lindberg Const. Co., Jamestown, **$75,815**. CD 8/11.

CONTRACTS AWARDED

Arkansas—State Hy. Dpt., Little Rock, minor drainage structures c. conc. 6.2 mi. Hy. 67, White Co., to Boyer & Johnson, Jackson, Tenn., **$349,452**. Bids 8/25. CD 8/16.

California—State Div. Hys., Sacramento, rein.-con. box girder bridge and grading, paving road connections over Harbor Freeway at 4 St., Los Angeles, Los Angeles Co., to W. J. Distelli, 4814 W. Jefferson Blvd., Los Angeles. **$512,854**. Bids 8/17. CD 8/22, under LB.

Ill., Chicago—City, City Hall, Zone 2, substructure trunnion bascule type, 2,151 ft. span Congress St. Superhighway, bridge, to M. J. Boyle, 2840 Elston St., Zone 47, **$819,720**. Bids 3/20, awarded 8/21. CD 4/21, under CA.

▲ **New Jersey**—New Jersey Turnpike Auth., 65 Prospect St., Trenton, Zone 8, Contr. 42, constr. substructures and superstructures of a viaduct at relocated Port St. and bridge carrying ramp A of the Port St. Interchange and other incidental work, Newark, Essex Co., to H. L. Harrison & Son Inc., Westfield, **$1,218,613**. Bids 8/22, awarded 8/28. CD 8/25, under LB.

PROJECTS COVERED

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $28,000; other public works $50,000; industrial buildings $68,000; other buildings $250,000.

Classes of Construction

(Name in order of Listing)

Water Supply
Sewers, Waste Disposal
Bridges
Streets & Roads
Earthwork, Waterways
Latin America
Public Buildings
Commercial Buildings
Industrial Buildings
Unclassified

Stages Reported

PROPOSED WORK: Including appointment of engineers or architects.

BIDS ASKED (new announcements only). For full calendar, see also preceding issues of ENR.

LOW BIDDERS: On jobs below $500,000 value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case a supplementary contract award report will be published.

CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issue in which last previous report was published.

Symbols and Abbreviations Include:

†	Federal Government
▲	Project of $1,000,000 or over.
B.A	Bids Asked
ENR	Engineering News-Record
CD	Engineering News-Record Construction Daily

STREETS AND ROADS

BIDS ASKED

Tex., Houston—Bids Asked—Meadowbrook Building, 7801 Howard Dr., grading, street const. aand asph. paving, Winkler, Hoard Drives. $65,000. G. T. Hutcherson and R. E. Bedell, 1212 Francis St., engrs.

LOW BIDDERS

Colorado—State Hy. Dpt., State Office Bldg., Denver, Aug. 25, stabilization, structures, oil processing 3.785 mi. State Hy. No. 92 from inside Delta easterly toward Hotchkiss, Colo. Proj. S 0125 (3), Delta Co., from E. J. Rippy & Sons, New Castle, **$96,753**, est. $102,610; grading, structure asph. 3.085 mi. on State Hy. No. 15 between Monte Vista and Capulin Rio Grande Co., from Peter Kiewit Sons Co., 1950 S. Colorado Blvd., Denver, **$76,152**, est. $80,828.

Delaware—State Hy. Dpt., Wilmington, Aug. 23, c. conc. widn., hot-mix asph. surf. 2.321 mi. Philadelphia Pike 23rd Street to Bellevue Rd.; Fed. Aid Proj. F-1 (5), Contr. 880 New Castle Co., from Olivere Paving & Constr. Co., 100 W. 7 St., **$428,557**; hot-mix asph. resurf. Kenton to Leasanton's Garage, Fed. Aid Proj. S-172 (2), Contr. 1050, Kent Co., from James Julian, Elsmere, **$180,703**. CD 8/2.

Ill., Chicago—Cook Co., Bd. Supervs., County Bldg., Chicago, Zone 2, paving Sec. 140-0506, from Standard Paving Co., 30 N. LaSalle St., Chicago, **$82,535***** paving Sec. 054-3034, M.F.T., from Arcole Midwest Corp., 3225 Main St., Evanston, **$195,571***** paving County Hy., Sec. 176-0112, from American Asphalt Paving Co., 10 S. LaSalle St., Zone 3, **$121,422**.

▲ **Indiana**—State Hy. Comn., State House Annex, Indianapolis, Aug. 29, bit. compacted aggregate surf. 3.812 mi. Wheatfield, Jasper Co. and bit. compacted aggregate surf. 3.44 mi. West of Atlanta, Hamilton, Co. from, Berns Constr. Co. 312 E. Washington St., Indianapolis, **$129,704**, est. $255,686; and **$153,750**, est. $168,793 respectively***c.conc. 5.05 mi. State Rd. 35, Kingsbury, LaPorte Co., from J. C. O'Connor & Sons Inc., St. Marys St., Fort Wayne, **$583,117**, est. $654,021***b.conc. resurf., widn., 1.13 mi. State Rd. 24 and bit. resurf., widn., 3.3 mi. State Rd. 14, Allen Co., from Hipskind Drainage Co., 1725 Winter St., Fort Wayne, **$67,299**, est. $83,737***b. conc. 0.331 mi. State Rd. 3 and 67 Muncie, Delaware Co., from Wm. D. Vogel Constr. Co., 3760 E. St. Clair St., Indianapolis, **$94,700**, est. $97,822***rejected bids Aug. 29, c.conc. 2.627 mi. State Rd. 24 and 30, Fort Wayne, Allen Co., L. B. **$546,254**; c.conc. 1.666 mi. State Rd. 46, Columbus, Bartholomew Co., L. B. **$225,067**. CD 8/8.

▲ **Massachusetts**—Commonwealth of Mass., Dpt. P. Wks., Boston, August 22, state hy. and bridge, F. A. Proj. FI 62 (5), Danvers Middleton Topsfield Boxford from Savin Constr. Corp., 10 Village St., East Hartford, Conn., **$3,953,370**. CD 8/4.

Missouri—State Hy. Comn., Jefferson City, August 25, from W. F. Menefee Constr. Co., Sedalia, graded earth and 24 ft. c. conc. pavement, 0.442 mi., Rte.

(Continued on page 90)

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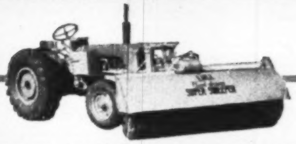

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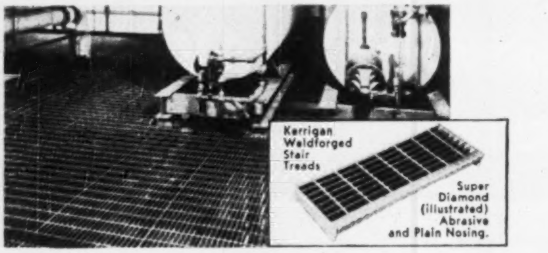
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Heavy duty 2" to 10" models for low or high head requirements. Super-Jet pumps for pressures to 275 lbs. Diaphragm and caisson pumps. Get catalog.

THE JAEGER MACHINE COMPANY
200 Dublin Avenue Columbus 16, Ohio

(Continued from page 38)

40, road from east and west of Odessa, Proj. FG I 288 (6), Lafayette Co., **$65,040**; graded earth 24 c. conc. 0.992 mi. Rte. 40, road from east and west of Odessa, Proj. F I 237 (2), Lafayette Co., **$112,935**; graded earth 24 ft. c. conc. 0.909 mi. Rte. 40 road from east and west of Odessa, Lafayette Co., **$86,900*****from Atkinson Windle Co., 10 Hickory St., Chillicothe, 24 ft. c. conc. 2.763 mi. Rte. 61, road from Cape Girardeau to Scott Co. Line, Proj. FI 289 (6) B, Cape Girardeau Co., **$186,222**; graded earth, 24 ft. c. conc. 1.224 mi. Rte. 61, road from Cape Girardeau Co. south, Scott Co., **$108,439**. CD 8/17.

Nebraska—State Dpt. Roads and Irrigation, Lincoln, blacktop, State Road No. 799, Stratton—Culbertson and grading and protection work, State Road No. 799, Stratton-Culbertson from Nichols Const. Co., Geneva, **$109,011** and **$314,774** respectively***bridges, State Road No. 799, Stratton-Culbertson from Christensen Corp., Fremont, **$158,693*****culverts, State Road No. 799, Stratton-Culbertson from Platte Valley Const. Co., Grand Island, **$67,351*****grading, sand graveling, FA— F-327, Loup City-Ansley from Blue Valley Const. Co., Lincoln, **$74,337**. CD 8/17.

North Dakota—State Hy. Dpt., Bismarck, Aug. 25, gravel surf. structural and incidental 10.694 mi. St. Hy. 11, west of Ashley, Proj. S-216 (4), McIntosh Co. from Schultz & Lindsay Const. Co., 621 1st Ave., Fargo, **$94,736*****gravel surf. and incidental 4.726 mi. St. Hy. 20, east of Sarles, Proj. S-187 (1), Cavalier Co. and gravel surf. and incidental 8 mi. St. Hy. 7 from Mercer West, Proj. S-317 (3), McLean Co. from Anderson Const. Co., Thief River Falls, Minn. **$131,584** and **$120,017** respectively***gravel surf. and incidental 9.13 mi. St. Hy. 18, from Hoople north and south, Proj. S-322 (6), Walsh Co. from Barnard Curtiss Co., Minneapolis, Minn. **$104,943*****b. conc. surf. and incidental 24.616 mi. U. S. 281 from Edgley to near Ellendale, Proj. F-662 (2) and F-150 (3), LaMoure and Dickey Counties from Megarry Bros., St. Cloud Minn., **$222,673**. CD 8/11.

Vermont—State Hy. Dpt., State House, Montpelier, highway, roads, Hardwick Greenboro, F 167 (3), Caledonia Co. from A. L. Dougherty Co., Woodbury, **$388,883**.

CONTRACTS AWARDED

Arkansas—State Hy. Dpt., Little Rock, blacktopping 7.4 mi. Hy. 159, Eudora, Chicot Co. and grav. base course, blacktop 7.5 mi. Dermott-Collins Rd., Drew Co. to Freshour Brothers, Sweet Home, **$53,794** and **$103,495**. Bids 8/25, awarded 8/25. CD 8/16.

D. C., **Wash.**—Distr. Comrs., District Bldg., widn., paving and repaving roadway of 13 St. N.W. from Logan Circle to You Street incl. Logan Circle N.W. Fed. Aid Proj. F-68 (2) Bids 8/1, awarded 8/23; and resurf. portions of certain roadways in vicinity of Dupont Circle, Bids 8/11, awarded 8/17, to Highway Constr. Co., P. O. Box 4437, **$131,670** and **$58,481** respectively***paving the roadway of Benning Rd. S. E. Hanna Place to Southern Ave; and Southern Ave. Benning Rd. to Bowen Rd. to Curtin & Johnson Inc., 125 Brentwood Rd. N.E., **$84,967**. Bids 7/31, awarded 8/15***imprv. various roadways with c. conc. and c. conc. curb, with b. conc. on c. conc. and b. conc. bases or alternates, to Donaldson Paving Inc. 20 Potomac Ave. S.W., **$106,967**. Bids 8/18, awarded 8/24***c. conc. alleys, or alternate c. conc. sidewalks, to E. B. Donaldson, 12 and Brentwood Rd. N.E., **$105,456**. Grand total $487,541. Bids 7/5, awarded 7/10. CD 7/14/44.

Ind., Fort Wayne—Bd. P. Wks., paving Clay St. between Main and Jefferson St. with 9 in. rein.-con. paving catch basins, curbs, etc., to Greene Constr. Co., Fort Wayne, Approx. **$55,000**. CD 8/24.

N. J., **Haddonfield**—Boro. Haddonfield, road surf. various streets, to Barrett Road Corp., Rt. 37, Lakehurst, **$50,084**. Walter H. MacNamara, 101 N. 7 St., Camden, engr.

New York—Bureau Contracts & Accounts, Albany, reconstruct 4.74 mi. Route 17 between Bolivar and Allentown, Alleghany Co., to Potter-De Witt Corp., Pavilion, **$773,991**. Bids 8/2. CD 8/7, under LB.

▲ **Pennsylvania**—State Hy. Dpt., 506 N. Office Bldg., Harrisburg, construct divided highway consisting of rein.-con. pavement 22 ft. and variable in width on each side of concrete divisor incl. const. of 2 plate girder bridges and 2 rein.-con. structures, construct crushed aggregate base with b.t. surf. 18, 20 and 22 ft. wide; rein.-con. pavement 48 ft. and variable in width, construct 2 rein.-con. bridges, rein.-con. pavement for paving railroad crossing, incl. 1,902 lin. ft. grading for railroad relocation, 17,141 ft. L. R. 185 (5), 53041 (1); 5304 (1); 53092 (2), T. R. 29, Schuylkill Co. to F. D. Kessler, Inc., Northumberland **$2,212,157**. Bids 8/18. Awarded 8/28. CD 8/22 under LB.

Tex., **San Antonio**—Brentwood Village Sub-division, c/o Ralph L. Elser, Majestic Bldg., street constr. and ason. paving to Colglazier & Hoff, Seguin Rd., **$56,600**. CD 8/24.

EARTHWORK, WATERWAYS

BIDS ASKED

† **Delaware**—B.A. 9/26—U. S. Eng., 121 N. Broad St., Phila., 1, Pa., dredging approx. 30,000 cu. yds., place measurement of material from in front of and adjacent to Corps of Engineers Wharves at Edge Moore.

† **Virginia**—B.A. 9/26—U. S. Eng., foot of Front St., Norfolk, alterations to Fairy Stone State Park Dam, Philpott Reservoir Proj., Smith River, on Goblintown Creek in Patrick Co. approx. 13 mi. west of Bassett. CIVENG 44-110-51-10. CD 8/3/44.

† **Virginia and North Carolina**—B.A. 10/5—U. S. Eng., foot of Front St., Norfolk, Va., clearing Parcel "M", Buggs Island Reservoir Proj., Roanoke River. Serial No. CIVENG-44-110-51-8. CD 7/6.

LOW BIDDERS

▲† **Colorado**—Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, construct 1.66 mi. Rattlesnake Tunnel, Estes Park-Foothills power aqueduct, Colorado-Big Thompson Proj., Spec. 3133, from Gibbons & Reed Co. 259 W. 3rd South St., Salt Lake City, Utah, **$1,294,313**. Est. $1,297,730. CD 7/31.

† **Illinois**—U. S. Eng., U. S. Court House and Custom House, St. Louis, 1, Mo., cancelled bids to have been opened, Aug. 29 stockpiling of material, constr. levees, Degognia and Fountain Bluff Levee and drainage Dist. Proj. Item III-D, Jackson Co. CIVENG-23-065-51-6. CD 8/18.

AIRPORTS

BIDS ASKED

▲† **Mich., Selfridge Air Force Base**—B.A. 9/19—U. S. Eng., Merchandise Mart, Chicago 54, Ill., constr. crash truck station adn., Eng. 11-032-51-4.

† **Ore., Salem**—AIRPORT—B. A. 9/26—Civil Aeronautics Admin., P. O. Box 3224, Seattle, Wash., ILS at McNary Field, Proposal No. 7-51-4477. CD 1/10/45.

LOW BIDDERS

▲ **Pa., Phila.**—AIRPORT—Dpt. P. Wks., City Hall Annex, Sept. 1, drainage, pipes, grading and paving Phila. International Airport, from Progressive Builders, Inc., Pennsauken, N. J. **$2,170,504**. CD 8/11.

R. I., **Warwick**—AIRPORT—State and Providence Plantations, State House, Providence, Aug. 23, install underground and surface electric facilities and appurtenances, Theodore Francis Green Airport from N. E. Machine & Electric Co., 77 Bayley St., Pawtucket, **$75,869**. CD 8/15.

CONTRACTS AWARDED

† **Fla., Jacksonville**—OPERATIONS, etc.—Civil Aeronautics Admin., 14 St. and Constitution Ave. N. W., Wash., 25, D. C., operations bldg. and installing surveillance radar scope control sys. at Imeson Airport, Owner builds, **$250,000**. G. B. Leonard, C. A. A., engr., engr. CD 1/10/45.

LATIN AMERICA

Brazil, Rio de Janeiro—The Engineering Club (Clube de Engenharia) Rio de Janeiro, 25 story headquarters bldg. to Graca Couto e Cia; fdns. to Jaoa Carlos Vital (Escritorio Tecnico Joao Carlos Vital) $5,000,000. Jacques Pilon, engr. c/o owner.

El Salvador—Repnblic of Salvador, San Salvador, hydro-electric dam and power plant on Lempa River to J. A. Jones Const. Co., 209 W. 4 St., Charlotte, N. C., U. S. A. $10,057,500. Bids 6/30. CD 7/14, under CA.

AMERICANS ABROAD

New Zealand, Wellington—Government of New Zealand, Wellington, will invite overseas consulting firms to design two or more major hydro-electric schemes for North Island. When plans and specifications are completed construction bids will be asked.

PUBLIC BUILDINGS

BIDS ASKED

Ont., Lauzon Lake—WORKSHOPS—B.A. 9/18—G. N. Williams, deputy minister, Dpt. P. Wks., Toronto, workshops, for Province of Ontario, Dpt. Lands and Forests, Toronto, Plans deposit $10.

Ont., Sioux Lookout—WORKSHOPS—B.A. 9/18—G. N. Williams, Dpt. P. Wks., Toronto, workshops, for Province of Ontario, Dpt. of lanos & forests, Toronto, Plans deposit $10.

Ont., White River—WORKSHOPS—B.A. 9/18—G. W. Williams, Dpt. P. Wks., Toronto, workshops for Province of Ontario, Dpt. Lands & Forest, Toronto, Plans deposit $10.

Mich., Portage—SCHOOLS—B.A. 9/19—Portage Twp. School Dist. Bd. Educ., Portage, two brick elementary schools, Milham Rd. and Pershing Schools. M. C. J. Billingham, 211 Woodward St., Kalamazoo, archt. CD 8/24.

Okla., Enid—WARD—B.A. 9/19—Bd. of Affairs, Capitol, Oklahoma City, Zone 5, ward bldg. at Northern Oklahoma Hospital. $600,000. Plans deposit $50. L. H. Bailey, Colcord Bldg., Oklahoma City, Zone 2, archt. CD 3/31.

Md., Camp Detrick—MUNITION BUILDING—B.A. 9/19—U. S. Eng., First and Douglas Sts. N.W., Wash. 25, D. C., munitions loading bldg. at Camp Detrick, Eng. 49-080-51-19 (19). Plans deposit $10.

Md., Baltimore—SCHOOL—B.A. 9/20—City, R. E. L. Williams, bldg. constr. engr., 410 Municipal Bldg., Zone 2, 3 story, bsmt. 4 wings Edison Boys Vocational School; Mergenthaler Printing School; brick, steel, limestone, concrete Barton Girls Vocational School, $6,000,000. Plans deposit $100, Taylor & Fisher, 1012 N. Calvert St., zone 2, archts., Henry Adams, Inc., 2315 St. Paul St., zone 18, mech. engrs. CD 2/7/45.

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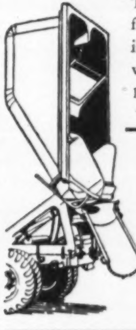

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1-¾ x 1-¾
Stained Yellow Bound with Steel Strapping

	Per 100	1000 Lots Per 100
12"	$7.15	$6.50
15"	8.80	8.00
18"	9.60	8.70
24"	11.50	10.45
36"	16.50	15.05

GRADE STAKES
¾ x 1-¾

	Per 100	1000 Lots Per 100
12"	$5.60	$5.10
15"	5.75	5.20
18"	5.80	5.25
24"	6.90	6.25
36"	9.70	8.80

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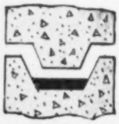
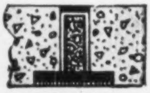

KEYED JOINTS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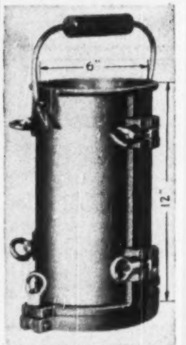

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SEVENTY YEARS OF SERVICE

Del., Dover—SCHOOL—B.A. 9/21—Delaware State Bd. Educ., Dover, school, $650,000. Victorine & Samuel Homsey, 917 Gilpin Ave., Wilmington, archts. CD 3/16.

Mass., Manchester—SCHOOL—B.A. 9/21—Town, School Bldg. Comn., 2 story, bsmnt., brick, steel, concrete grade school Ayers Farm, Summer and Lincoln Sts., $865,000. Plans deposit $30, Coolidge, Shepley, Bulfinch & Abbott, 1 Court St., Boston, archts. CD 2/27.

N. Y., New York—SCHOOL—B.A. 9/21—Supt. School Bldgs., Design and Const., 49 Flatbush Ave. extens. Brooklyn, Zone 1, general constr.; plumbing and drainage, heating and ventilating, electrical and lighting fixtures for the P.S. 152 addn. Nagle and Hillside Aves., Elwood and Sickles Sts. $497,600. Plans deposit $6 general const. $5 each plbg. and drainage; heating and ventilating. $7 electrical and lighting fixtures. CD 9/8/48.

Ark., Gurdon—HOSPITAL—B.A. 9/25—City, Gurdon, city hospital.

Va., Richmond—SCHOOLS—B.A. 9/25—City School Bd., 312 N. 9 St., Franklin School adn. on Midlothian Pike, $336,500. Dixon & Norman, 1303 E. Main St., archts.; Mary Munford Elementary School, Grove Ave. and Westmoreland St. $875,000. Walford & Wright, 103 E. Cary St., archts.; Summer Hill Elementary School adn., Courthouse Rd. $258,440. Merrill C. Lee, 601 E. Franklin St., archt.

N. C., Winston-Salem—HOUSING—B.A. 9/26—Winston-Salem Housing Auth., c/o Northrup & O'Brien, archts., Reynolds Office Bldg., 178 unit Happy Hills Gardens Housing Proj. Plans deposit $25. CD 4/26.

Pa., Willow Grove—SCHOOL—B.A. 9/27—Upper Moreland School Bd., Willow Grove, elementary school. Approx. $250,000. MacKenie & Wigmore, 117 S. 17 St., Phila., archts. CD 4/21.

† **Calif., San Fernando**—KITCHEN, etc.—B.A. 10/10—Veterans Admin., Vermont Ave. between H & I Sts. N.W., Washington, 25, D. C., kitchen and dining hall adn. to infirmary bldg. No. 2, incl. existing Bldg. 2 alterations, connecting corridor No. 2-41 adn., roads, walks, grading, drainage, plumbing, heating ventilating, electrical work.

LOW BIDDERS

Ill., Lansing—SCHOOLS—School Dist. 158, 2721 Ridge Ave., Junior High School, Indiana Ave. and Calvin Coolidge School adns., from Stanley A. Nelson, 543 W. 79 St., Chicago, Zone 20. **$458,632**. CD 8/11.

Ill., Skokie—SCHOOL ADDN.—School Dist. 68, Skokie Rd. and Gross Point Rd., Sharp Corner School addn., from Ashland Constr. Co., 6808 N. Clark St., Chicago, Zone 26, **$300,000**. CD 7/10.

▲ **Ind., Indianapolis**—SCHOOL—Bd. School Comrs., A. V. Chad, pres. 150 N. Meridian St., Indianapolis, Aug. 25, brick, rein.-con., structural steel high school, Madison Ave. and Pleasant Run Blvd., from Jas. McHugh Constr. Co., 6449 S. Pak St., Chicago, Ill., **$3,350,000**; heating, plumbing and ventilating, from Grehn Bros., 1028 N. Illinois St., Indianapolis, **1,234,331**; electric wiring, from Sanborn Elec. Co., 307 N. Illinois St., Indianapolis, **$272,340**. CD 7/11.

Ky., Lexington—MINERAL INDUSTRIES BLDG.—University of Kentucky, August 17, mineral industries bldg., from C. W. Mueller, 619 Baxter Ave., Louisville, **$264,900**. CD 5/20/48.

▲ **Md., Baltimore**—SCHOOL—City, Bureau Bldg. Constr., 410 Municipal Bldg., Zone 2, Aug. 30, brick, concrete, Steel, cinder block Cherry Hill School (colored), Cherry Hill and Seabury Rds., from Philip Vizzini & Son, Inc., 504 Stanford Rd., **$1,047,782**. CD 8/17.

Mass., Danvers—SCHOOL—Town, School Dpt., Town Hall, August 23, brick, steel, concrete elementary school, Pickering St., from Walsh Constr. Co., Inc., 119 Webb St., Salem, **$412,890**. CD 8/17.

Mass., Grafton—SCHOOL—Town, School Dpt., R. G. Strake, supt., Aug. 29, Junior Senior High School, from M. J. Dyer & Co., 58 Frout St., Worcester, **$628,980**. CD 8/14.

N. H., Derry—SCHOOLS—Town, Derry, Aug. 22, Hood Memorial School from L. E. Martel & Son, 684 Auburn St., Manchester, **$309,372*****grade school, Lannox Rd. from Camillo Profenno Co., 127 Marginal Way, Portland, Me., **$276,429**. Irving W. Hersey & Assoc., Dover Rd., Durnam, archts.

▲ **N. J., Hackensack**—SCHOOL—Bd. Educ., Hackensack, school for 700 students, from La Fountain, Inc., 161 Beech St., **$1,122,000**. CD 8/1.

N. C., Winston-Salem—SCHOOL—City, Winston-Salem, John W. Moore elementary school from Fowler-Jones Const. Co., Reynolds Office Bldg., **$572,366**.

† **Pa., Altoona**—BARRACKS, etc.—U. S. Dpt. of Army, First and Douglas Sts., Wash. 25, D. C., barracks, mess hall and operations bldg., from Hadley Contg. & Constr. Co., 1213 Wood St., Phila., **$933,000**.

CONTRACTS AWARDED

Ark., Camden—HOSPITAL—Ouachita Co., Camden, general contract 80,000 sq. ft., brick, concrete, steel Ouachita County Hospital and Health Center, to Atlas Constr. Co., Texarkana, **$659,480**; plumbing and heating to A. W. Johnson Co., P. O. Box 930, Texarkana, **$307,000**. Bids 7/31. CD 8/23, under LB.

Va., Richmond—SCHOOL—City, School Bd., 312 N. 9 St.; alterations and adns. Webster Davis School for Negroes to C. Elmo Nuckols, 1103 E. Main St. **$434,628**. Bids 8/28. CD 8/10.

Ont., Toronto—SCHOOL—First Twp., School Area of North York, 148 Wilson Ave., Toronto, 2 story, structural steel, frame, brick Humberlea School, to Hughes Constr. Co. Ltd., 365 Rogers Rd., Toronto, Approx. **$250,000**. Bids 7/25. CD 7/14.

(Continued on page 95)

Fills a gondola in 21 minutes

(including switching)

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BUILDS ITS OWN RAMP
LOADS THE CAR
SWITCHES CARS

The versatile Eimco 104 replaces several other pieces of equipment wherever it is used. The job illustrated above retired a boom type shovel, a bulldozer and a small switcher when the 104 was installed. The speed, power and dependability of the 104 bring new low costs into the field of material handling. Loading the 60 ton gondola with sand in 21 minutes including switching time is only one of its accomplishments.

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(Continued from page 92)

COMMERCIAL BUILDINGS

BIDS ASKED

Ill., Pekin—CHURCH, etc.—Bids Asked—St. Paul Evangelical Reformed Church, 103 N. 7 St., church with sunday school $350,000. Benjamin Franklin Olsen, 19 S. LaSalle St., Chicago, Zone 3, archt.

SOON LETS CONTRACT

Ia., Mount Pleasant—DORMITORY—Iowa Wesleyan College, Mt. Pleasant, soon lets contract women's dormitory. $300,000. W. M. Ingemann & M. V. Bergstedt, 345 Minnesota St., St. Paul, Minn., archts. CD 8/21.

Mass., Cambridge—BOTANY—Harvard University, 16 N. Harvard St., soon lets contract 4 story, brick botany bldg. Approx. $500,000. Coolidge, Shepley, Bulfinch & Abbott, 1 Court St., Boston, archts.

N. H., Nashua—HOSPITAL—Trustees, Charles H. Nutt Estate Hospital Corp., George M. French, pres., 86 Main St., soon lets contract hospital. Approx. $250,000. Alfred T. Granger Assoc., Main St., Hanover, archts.

Tenn., Maryville—CHURCH SUNDAY SCHOOL—Charles L. Bolton, archt., 1505 Race St., Phila., Pa., soon lets contract church and Sunday school for New Providence Presbyterian Church, 315 S. College Ave., Maryville. Approx. $250,000. CD 5/23/46.

LOW BIDDERS

Mich., Traverse City—HOSPITAL—James Decker Muncon Hospital, Traverse City, Aug. 16, 3 story brick, steel, concrete hospital from The Christman Co., 408 Kalamazoo Plaza, Lansing, **$707,767.** CD 8/9.

CONTRACTS AWARDED

Ala., Birmingham—APARTMENT DEVELOPMENT—N. H. Waters, Jr., c/o contractor, apartment development to G. A. Paul, 14 Bonita Dr., Birmingham. Approx. **$250,000.** Bids 7/6. CD 7/7.

Colo., Denver—MORTUARY—Olinger Mortuary, Speer Blvd. and Sherman Sts., 1 story 15,000 sq. ft., mortuary at East Colfax Ave. and Magnolia St., to Mead & Mount Constr. Co., Denver National Bldg., Denver, **$300,000.** Raymond H. Ervin, Patterson Bldg., Denver, archt. and engr. Awarded 8/18.

Del., Wintherthur—HOUSES—H. F. Dupont, Winterthur, houses, separate contracts, **$300,000.** Thomas F. Waterman, 1273 New Hampshire Ave., Wash., D. C., engr.

Ill., Chicago—SCHOOL—Plato Greek Orthodox Church, 5545 W. Harrison St., Zone 44, 2 story, steel, stone brick, concrete school, to Harvey A. Hanson, 1851 N. Elston St., Chicago, Zone 47, **$250,000.** Peter E. Camburas, 105 W. Madison St., Zone 3, archt. Awarded 8/23.

Kan., Salina—HOSPITAL and NURSES HOME—St. John's Hospital, Salina, hospital and nurses home addn., to Walter Butler, Minnesota Bldg., St. Paul. **$500,000.**

Md., Silver Spring—RESIDENCES—Connecticut Gardens, Inc., c/o builder, fifty 1 story, brick, 25x37 ft., cinder block residences in 11600 block Highview Ave. and 11700 block Hatcher Pl., to A. Compitelli & N. Brisker, 38 and Bunker Hill Rd., Brentwood. **$300,000.**

Mich., Greenville—HOSPITAL—Greenville United Memorial Hospital Bd. Trustees, Greenville, 3 story brick, steel, concrete hospital to W. E. Wood Co., 4649 Humboldt St., Detroit, **$970,000.** Bids 8/17. CD 8/8.

N. J., Ewing Twp. (Trenton P. O.)—RESIDENTIAL DEVELOPMENT—Highland Development Corp., Fairview Ave., R.D. 5, Trenton, residential development, 7 Ave., etc., separate contracts. **$250,000.**

N. J., Hamilton Twp (Trenton P. O.)—RESIDENTIAL DEVELOPMENT—Bissert Corp., Hamilton Twp., Trenton, residential development Collins Rd., separate contracts. **$250,000.**

N. J., Westfield—APARTMENT DEVELOPMENT—Ben Fineman, 1212 S. Broad St., Phila., Pa., apartment development, separate contract **$700,000.** Edward A. L. Cox, 709 Market St., Camden, archt.

N. J., Woodlynne—RESIDENTIAL DEVELOPMENT—S & P Constr. Co., 2251 Baird Blvd., Camden, residential development, Woodlynne Ave., etc., separate contracts. **$250,000.** Dante J. D'Anastasio, 1815 Federal St., Camden, archt.

▲ **O., Columbus**—HOUSING—Beverly Manor, c/o Dr. Webster R. Robinson, 273 Mayfair Blvd., 122 3 story brick, steel apartments, in Beverly Manor development, north of Broad St. and west of James Rd., to Don A. Loftus & Assoc., Inc., 35 Edgevale Rd. Approx. **$7,930,000.**

Tex., Abilene—EDUCATIONAL—St. Paul Methodist Church Congregation, Abilene, 3 story educational bldg., concrete pier and beam fdn. to C. S. Cates & Sons, 1389 Santos St. Approx. **$250,000.** CD 12/13/49.

Tex., Bellaire—DWELLINGS—Pabst Co., 510 Sikes St., Houston, 82 dwellings. Own forces. **$960,000.** CD 8/18.

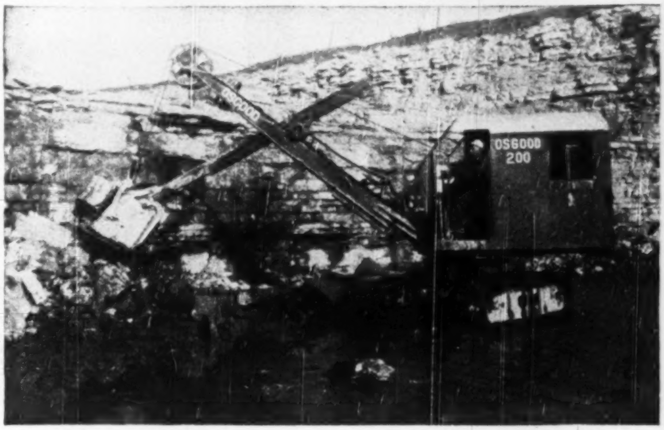
Tex., Fort Worth—HOUSING—Colonial Developing Co., Flatiron Bldg., housing proj. Own forces. **$250,000.** CD 8/21.

Tex., Houston—Lynwood Corp., c/o Earl Gregg, 2620 Bissonet St., 45 addnl. housing units. Owner builds. Approx. **$375,000.** CD 8/18.

Tex., Houston — DWELLINGS — Meadowbrook Building Co., 7801 Howard Dr., 75 addnl. dwellings, 200 acre site across from Freeway from Meadowbrook sub-division. Owner builds. **$625,000.** CD 11/14/49.

OSGOOD

Model 200 serves as jack-of-all-trades for Lebanon Stone Co., Lebanon, Ky.



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Strips castings from molds and handles them without breakage

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PHILA. 4, PA.

Tex., Midland—RESIDENCES—James K. Boyce, W. Hy. 80 addnl. 50 residences. Own forces. Approx. $325,000. CD 7/28.

Tex., San Antonio—HOUSING—Frank H. Silcock, Gunter Bldg., housing proj., purchase and day labor. Approx. $250,000. CD 8/21.

▲ **Que., Longueil**—EXTERNAT CLASSIQUE—Corp. Epicale Catholic Diocese of St. John, St. Johns, 100x480 ft., rein.-con. frame brick, stone Externate Classique on Cambly St. at Gentilly St., to Roland Chalifoux Ltd., 6275 [illegible] Ave., Longueil. Approx. $1,500,000.

Que., Montreal—OFFICES, etc.—Canadian Printing Ink, c/o contractor, to Louis Donolo Inc., 8320 St. Lawrence Blvd., Montreal. Approx. $300,000. Archambault & Roy, 6370 First Ave., Rosemount, engrs.

INDUSTRIAL BUILDINGS

BIDS ASKED

▲ **Ill., Chicago**—TERMINAL—Bids Asked—Greyhound Corp., 151 W. Jackson St., Zone 4, 2 story, 140,000 sq. ft. superstructure of Terminal bldg. for Buses, $2,000,000. Skidmore, Owings & Merrill, 100 W. Monroe St., Zone 3, archts. CD 3/3/49.

▲ **N. M., Farmington**—REFINERY—Bids Asked—Delhi Oil Corp., c/o C. W. Murchison, 1315 Pacific St., Dallas, Tex., gasoline refinery. $1,750,000. CD 2/2.

Pa., Phila.—WAREHOUSE—Bids Asked—Samuel I. Oshiver and J. Raymond Knopf, archts., 1704 Walnut St., 1 story 3,500 sq. ft. steel, masonry warehouse for Sweetie Beverages, Inc., 609 N. American St. $70,000.

SOON LETS CONTRACT

Ind., Sullivan — HEADQUARTERS — R.E.M.C., 106 W. Washington St., soon lets contract headquarters bldg., Main and Beech Sts. Plans deposit $25. Lester W. Routt, Vincennes, archt.

Mass., Worcester—SHOP—Crompton & Knowles Loom Works, 93 Grand St., soon lets contract, 1 story, 120x131 ft., concrete, steel forge shop expansion, $75,000.

Neb., Bellevue—POWER PLANT—Loup River Public Power Dist., Columbus, soon lets contract electrical installations at Bellview Power Plant. Sargent & Lundy, 140 S. Dearborn St., Chicago, Ill., engrs. CD 9/1, under Unclassified.

W. Va., Nitrol—CHURN MIX—American Viscose Corp., 1617 Penna Bldg., Phila., Pa., soon lets contract churn mix bldg., Approx. $250,000. R. M. Pfaslzgraff, co. engr.

LOW BIDDERS

Fla., Orlando—PLANT—Orlando Sentinel-Star, Orlando, newspaper plant, from R. E. Clarson, Inc., 2000 13 Ave. N., St. Petersburg, $298,087.

CONTRACTS AWARDED

▲ **D. C., Wash.**—POWER PLANT—The Potomac Electric Power Co., 10 and E Sts. N. W., Benning Road Power plant addn., northwest of here, to Stone & Webster Eng. Co., 90 Broad St., New York, N. Y. $8,000,000.

Fla., Jacksonville—PLANT—Cook Chemical Co., 935 N. Wabash St., Kansas City, Mo., chemical plant, Owner builds, $150,000. G. E. Groschen, c/o owner, archt. Awarded 8/23.

Ill., Chicago—FACTORY—Avondale Steel & Iron Corp., 3388 Avondale St., Zone 41, steel, brick, concrete 10,000 sq. ft. factory, to Nathan Flyer & Son, 161 W. Elm St., Chicago, Zone 10. $75,000. Awarded 8/14.

Ill., Lemont—LABORATORY—Fournier Institute of Technology, 127 and Archer Ave., 2 story, bsmnt., rein. con.-brick lannon stone laboratory, to C. W. Haynes Co. 135 S. La Salle St., Chicago, Zone 3, $358,000. Toussaint & Robinson, 30 N. LaSalle St., Chicago, Zone 2, archts.

Kan., Kansas City—WAREHOUSE—Parker Transfer Co., 6408 W. 65 Terrace, warehouse, to Ed Rost, Bellefountaine, Kansas City, $75,000, E. O. Brostrom, 4302 Oak St., archt. CD 8/17.

Md., Baltimore—OFFICES and SHOPS—Diecraft Co., 1500 Guilford Ave., 1 story, part bsmnt., 30x60x122x182 ft., brick, cinder block office and machine and die shops, Pulaske Hy., Golden Ring, to Morrow Bros., Inc., 2315 N. Charles St., Zone 12.

Minn., Minneapolis—FERTILIZER BLDG.—Land O'Lakes Creamery, 2215 Broadway N E, 1 story, 101x221 ft. fertilizer bldg. adn. at 2429 Broadway NE, to Kraus Anderson, Inc., 501 S. 8 St., $249,000, Chemical Engr. Co., Green Bay, Wis., engr.

N. J., Teterboro—PLANT—Buitoni Macaroni Corp., 99 Hudson St., New York, N. Y., constr. 75,000 ft. factory on Hyler St. near Teterboro Airport, to Hunt Eng. Co., Liberty Rd., Bergenfield. $750,000.

O., Toledo—FACTORY—Save' Electric Co., 615 Front St., 1 story 100x313 ft. brick, concrete factory adn. to mfg. electric bulbs, 615-631 Front St. to Comte Const. Co., 912 Summit St. Approx. $100,000. Stephan Jokel, 905 Jefferson St., archt.

Tex., Georgetown—PLANT—Williamson County Creamery, Georgetown, creamery plant. Own forces. Approx. $75,000.

Alta., Edmonton—WAREHOUSE—General Steel Wares Ltd., 190 River St., Toronto, Ont., 121x213 ft., concrete, steel, masonry warehouse, to Christensen & MacDonald, 612 Tegler Bldg., Edmonton, $159,000. Dewer & Assocs., 618 Northern Bldg., Edmonton, archts.

Man., Winnipeg—PLANT—John Wood Mfg. Co. Ltd., McPhillips & Winnipeg Sts., 1 story, 200x320 ft.,

(Continued on page 98)

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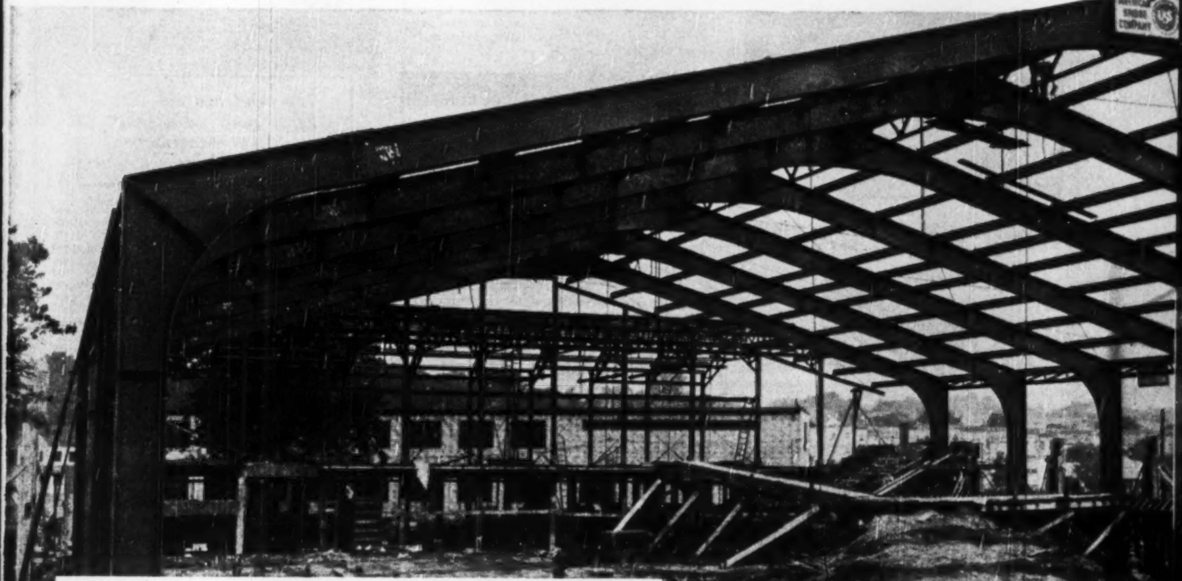
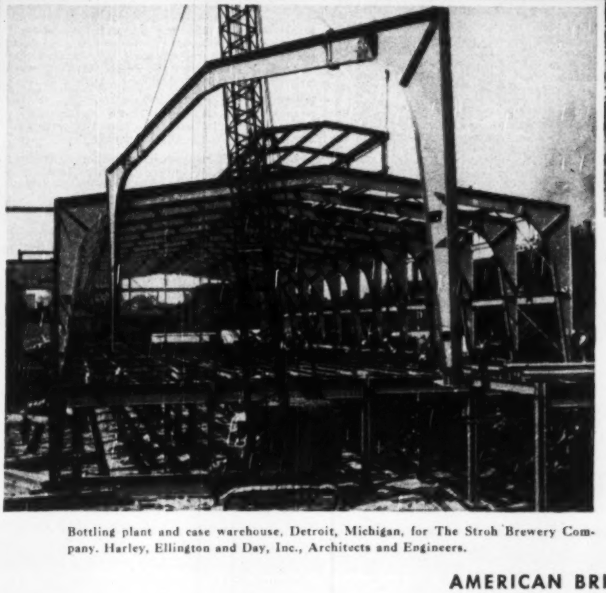
Gives more usable floor space! • Saves erection time and costs!



Field House—Auditorium for St. Joseph's College, Philadelphia. John McShain, Inc., General Contractor; Emile G. Perrot, Architect; Charles H. Wolf, Consulting Engineer.



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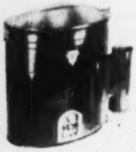

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WRITE TO

DIXIE CUP COMPANY

EASTON, PA.

(Continued from page 96)

structural steel frame, brick plant, to Commonwealth Constr. Co., 300 Royal Bank Bldg., Winnipeg, Approx. **$475,000**. Bids 8/25. CD 8/23.

Ont., Chatham—PLANT—Canada Packers Ltd., 2000 St. Clair Ave. W., Toronto, 1 story 190x200 ft., fertilizer plant in Industrial Park, to Huron Constr. Co., Ltd., 123 Victoria St., Chatham, approx. **$400,000** to **$500,000**. CD 8/8.

Ont., Toronto—WAREHOUSE ADDN.—Glidden Co. Ltd., 351 Wallace Ave., 1 story 50x142 ft. steel frame brick warehouse addn., to Mollenhsuer Contg. Co. Ltd., 188 Perth Ave., Toronto, Approx. **$125,000**. Mathers & Haldenby, 15 St. Mary St., Toronto, archts.

Que., Montreal—GARAGE, etc.—S. Kantor, 4594 St. Lawrence Blvd., 2 story penthouse, 63x135 ft., brick, garage and showroom on Decarie blvd., to Main Constr. Co. Registered, 4535 City Hall Ave., Montreal, Approx. **$150,000**.

UNCLASSIFIED

BIDS ASKED

† **Wyoming**—VENTILATING SYSTEM—B.A. 9/21—Bureau Reclamation Dpt. Interior, Casper, installing heating and ventilating sys. for Kortes Power Plant, Kortes Unit, Oregon Tail Div., Missouri River Basin Proj., Spec. 3164.

LOW BIDDERS

Ill., Chicago—PARK—Chicago Park Dist., 435 E. 14 St., Zone 5, Hamilin Park at 2000 W. Wellington St., from Geo. D. Hardin, 2130 S. Michigan St., Chicago, Zone 16, **$62,343**; Dvorak Park at 1119 W. Cullerton Ave., from Tony Ross & Co. 4118 W. North Ave., Zone 51, **$53,422**. CD 6/11/45.

N. J., Atlantic City—COMFORT STATION—Atlantic City Bd. Comrs., comfort station on New York Ave., from R. A. Prendergast & Son 5 S. Virginia Ave., Atlantic City, **$108,000**. Rosenstein & Turon, Guarantee Trust Blcg., archts.

CONTRACTS AWARDED

Iowa—RURAL DISTRIBUTION LINES—Farmers Electric Co-operative, Greenfield, 74.70 rural distr. lines and 6.5 mi. conversion and 50.50 mi. of line removal in Cass, Adair, Madison and Union Counties, Iowa, being in Proj. Iowa 73L Adair, to Hoak Constr. Co., 621 63 St., Des Moines, **$158,174**. Bids 8/23. CD 8/11.

Kansas—RURAL DISTRIBUTION LINES—Coffey Co. Rural Electric Co-operative Assoc., Inc., Burlington, 70 mi. rural distr. lines in Anderson, Coffey, Franklin, Greenwood and Woodson Counties, own forces, **$225,000**. CD 7/14.

Montana—RURAL DISTRIBUTION LINES—Lincoln Electric Co-operative, Eureka, 127.2 mi. rural distr. lines, to Smith & White, Pier 65, Seattle, Wash., **$286,422**. Bids 8/15. CD 10/19/49.

Nebraska—PIPE LINES—Kansas-Nebraska Natural Gas Co., Phillipsburg, Kan., extend gas pipe lines from Grand Island, Neb. northeast to northeast sect. of Nebraska to supply Norfolk and other towns in that sect. of state. Approx. **$200,000**; new construction to increase capacity to pipe lines in Nebraska and Kansas and to extend lines to Pleasanton, Neb. in Central sect. Approx. **$729,331**. Owner builds. Thomas Creight, Jr.; c/o owner, engr. CD 6/12.

N. Y., New York—PIER—Comr. Marine & Aviation, Pier A, North River, foot of Battery Pl., Zone 4, Contr. 2740 dredging, cutting off old piles, installing sand drains and other work for constr. of new Pier 57, North River to O'Brien Bros. Inc. and Quist Const. Co., 233 Broadway, Zone 7, **$458,820**. **Bids 8/14**. CD 8/3.

Wyoming—RURAL DISTRIBUTION LINES—Niobrara Electric Assn., Luxk, 463.50 mi. rural distr. lines, to Continental Co., 54 Beverly Place, Dayton, O. **$436,491**. Bids 8/15. CD 8/18.

† **Canada**—LIQUID FUEL SYSTEMS—U. S. Eng. (APO 942, c/o PM Seattle, Wash) Anchorage, Alaska, Aug. 22, 3 bulk liquid fuel sys., complete with storage and pumping facilities at Whitehorse (2,250 bbl. capacity) Fort Nelson (5,000 bbl. capacity) and Nameo (5,000 bbl. capacity), to Sparling, Fowler & Murphy, Las Vegas, Nev., **$94,808**. **Bids** 8/22. CD 8/16.

N. B., Moncton—HEATING DISTRIBUTION SYSTEM—Canadian Commercial Corp., 70 Lyon St., Ottawa, Ont., heating distr. sys., Tender G3-29-634, to Moncton Plumbing & Supply Co., 566 Main St., Moncton, Approx. **$50,350**.

Que., Montreal—SERVICE TUNNEL—McGill University, Sherbrooke St., W., service tunnel between Art's bldg. and Redpath Library, to A. F. Byers Constr. Co. Ltd., 5675 Western Ave., **$60,000**. Maxwell & Pitts, 1158 Beaver Hall Sq., Montreal, archts.

PROPOSED PROJECTS

WATER SUPPLY

Calif., Tustin—Orange County Water Dist. 8, 10642 Newport Rd. El Madera, voted **$246,000** bonds, water facilities. Roy Browning Santa Ana, engr.

Okla., Muskogee—City, Muskogee, defeated bonds, water works extens., **$125,000**. Benham Engr. Co., American National Bldg., Oklahoma City, consult. engrs. CD 7/25.

Okla., Stroud—City, Stroud, water supply. **$100,000**. Clarence Burch, State Capitol Bldg., Oklahoma City, Zone 5, consult. engr.

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Tex., Channelview—Harris County Water Control & Imprvt. Dist. 1, Channelview, voted bonds, water supply wells, **$75,000**; steel elevated storage tank, concrete ground reservoir, **$155,000**; water distr. lines, **$167,490**. Garrett Eng. Co., 5008 Almeda Rd., Houston, consult. engrs. CD 8/21.

Sask., Sikatoon—Municipality, imprvs. at water works and rehabilitation of primary water mains, **$220,000**. H. McIvor Weir, City Hall, city engr. CD 8/12/49.

SEWERS, WASTE DISPOSAL

▲ **Calif., Antioch**—City, City Hall, **$1,235,000** bond election Oct. 17, sewage disposal plant and sewage lines.

Calif., Taft Heights—Taft Heights Sanitary Dist., Courthouse, Bakersfield, voted $81,000 bonds, constr. sewage treatment plant and main trunk sewer line as a joint project with the Ford City Sanitation dist., **$182,552**. R. E. White, 1716 Oak St., Bakersfield, engr. CD 5/24/49.

Miss., Gulfport—City, defeated bonds August 22, sanitary sewer imprvs., **$2,500,000**. CD 8/11.

Mo., Vinita Park (St. Louis 14, P. O.)—Village Charles W. Ermes, mayor, Village Hall, 8205 Jackson Ave., Zone 14, bond election Sept. 19 constr. sys. trunk and lateral sewers, **$250,000**. CD 7/18.

N. Y., Hilton—Village, Hilton, sanitary sewers and treatment plant. **$175,000**.

Okla., Enid—City, Enid, sewage disposal plant, **$400,000**. Hudgins-Thompson-Ball & Assoc., 1100½ W. Main St., Oklahoma City, consult. engrs. CD 4/6/49.

Okla., Muskogee—City, Muskogee, defeated bond storm sewers, **$350,000**. Benham Engr. Co., American National Bldg., Oklahoma City, engrs. CD 7/25.

Tex., Channelview—Harris County Water Control and Imprvt. Dist. 1, Channelview, voted bonds, treatment plant, **$200,000**; sanitary sewer collection lines, **$231,135**. Garret Eng. Co. 5008 Almeda Rd.; Houston, engrs.

Tex., Houston—A. E. Bailey, 3016 Jarrard St., sanitary sewers and drainage in Reid Terrace off Reid Rd. **$60,000**; sanitary sewers and drainage, in area of Sunnyside Gardens. **$55,000**. R. J. Putney, 2211 Norfolk St., consult. engr.

Tex., Houston—Texas Millions, Inc., MUM Bldg., sanitary sewers, **$150,000**; storm sewers, **$100,000**. Still, Wildman & Crockett, 3509 Almeda Rd. consult. engrs.

Ont., Trenton—Town, P. W. Larry, town, clk., Trenton, sewerage sys. incl. disposal plant, 3 pumping stations, sanitary and storm sewer, **$726,950**. Gore & Storrie, 1130 Bay St., Toronto, engrs. CD 8/9.

BRIDGES

Michigan—State Hy. Comn., Lansing,

Newaygo Co.—5 span rolled bram bridge over Muskegon River, 555 ft. long steel plate girder, east and west 24 ft. lanes, over **$50,000**, Harry C. Coons, State Hy. Dpt., Lansing, ch. engr.

Oklahoma—State Hy. Dpt., Capitol, Oklahoma City, Zone 5,

Custer Co.—new bridge over Washita River on U. S. 66 at Clinton, **$225,000**. S. K. McClland, c/o owner, engr.

Ont., Toronto—City, City Hall, bridge across ravine at Glenview Ave., incl. 66 ft. wide rein.-con. with 46 ft. pavement, **$290,000**.

STREETS AND ROADS

Mich., Sault Ste Marie—City, Dpt. P. Wks., City Hall, pave and widen 10 to 13 various streets, $200,000.

Okla., Muskogee—City, Muskogee, defeated bonds, access highways $540,000. Benham Engr. Co., American National Bldg., Oklahoma City, consult. engr. CD 7/18.

Tex., Angleton—Dow Chemical Co., Freeport, constr. toe drain sys., near here. **$100,000**.

† **Tex., Fort Hood**—U. S. Eng., 606 Santa Fe Bldg., Galveston, parking area paving and storage. **$500,000**.

Tex., Houston—A. E. Bailey, 3016 Jarrard St., street constr., paving in Reid Terrace, off Reid Rd. **$50,000**; street constr., paving, curbs, gutters, in area of Sunnyside Gardens. $60,000. R. J. Putney, 2211 Norfolk St., consult. engr.

Wash., Yakima—Yakima Co. Co. Courthhouse, imprv. 3.5 mi. Cowiche-Tieton Rd., **$110,000**; 3 mi. Bumping Lake Rd., **$50,000**; 3.8 mi. Cottonwood Rd., **$68,000**; 3.5 mi. Lateral 1 and Keys Rds., **$56,000**; 5.5 mi. Roza Dr. Highlane and Lucy Lane Rds., **$85,000**; 2. 4 mi. Rosenkranz Rd. **$40,000**; 1.5 mi. Upland Way, **$25,000**; 0.75 mi. Piedmont Rd., **$12,500**; 1.8 mi. Stone Rd., **$31,500**; 1.25 mi. Dazet Rd., **$22,500**; 1.2 mi. Naches-Selah Rd., **$20,000**; 2.3 mi. Keys Rd., to Moxee Hy. **$30,000**; 1.25 mi. Riverside Rd., **$18,000**; 1.5 mi. Sheller and Bethany Rds., **$22,500**. O. E. Brashears, co. engr.

EARTHWORK, WATERWAYS

Ark., Blytheville—Drainage Dist. No. 13 of Mississippi Co., c/o secy., rehabilitation of drainage district sys. incl. 43 mi. cleaning out old ditches, constr. 22 mi. new ditches, 2½ miles extens. of outlet into Big Creek, constr. new bridge, moving houses, etc. **$303,000**.

Okla., Enid—City, flood control works. **$600,000**. Taft & Williamson, Enid, consult. engrs.

(Continued on page 101)

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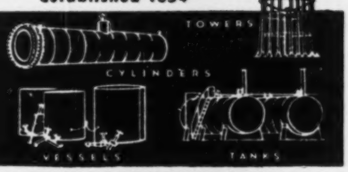

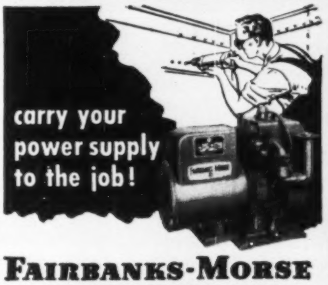
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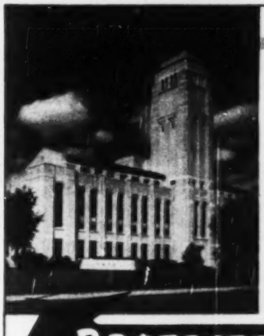

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(Continued from page 99)

▲ **Washington**—U. S. Eng., 4735 E. Marginal Way, Seattle, Zone 4, deepening outlet of Lake Sammanish building structure at lake outlet for control of lake elevatrions, enlargement of Sammanish river channel, channel, excavation of Redmond Bear Creek near its confluence and low levee along bank of North Creek, Seattle, **$1,109,000**. Lt. Col. J. P. Buehler, dist. engr.

AIRPORTS

Mich., Flint—TERMINAL BUILDING—City, Mayor's Office, City Hall, plans by McKenzie, Knuth & Klein, 227 Capitol Theater Bldg., terminal bldg. at Bishop Municipal Airport, **$225,000**. CD 9/12/47.

† **Wash., Whidbey Island**—FUEL STORAGE—Yards & Docks Annex, Navy Dpt., Arlington, Va., 30,000 barrel fuel-storage capacity at Naval Air Station, **$300,000**.

† **Alaska, Fairbanks**—GYMNASIUM—U. S. Eng., (APO 942, c/o PM, Seattle, Wash.) Anchorage, gymnasium and indoor training center and an infirmary at Eielson Air Base. **$978,500**.

▲ **Alaska, Fairbanks**—ROADS, etc.—U. S. Eng., Anchorage, roads, headquarters, etc. at Ladd Air Force Base, **$2,796,200**. Col. B. E. Seeman, distr. engr.

LATIN AMERICA

Mexico, Aguaruto—Arizona Fertilizers, Inc., 734 E. Southern Pacific Dr., Phoenix Ariz., plans fertilizers plant. **$2,000,000**.

Mexico, Mexico City—Camiones y Maguinaria, S. A. Edison y Emparar, Mexico City, plans pumps for deep wells factory. $250,000.

Mexico, Mexico City—Hidroelctra, S. A. Torres Adalaid, 607, Col. del Valle, Mexico City, plans gas water heaters factory. $250,000.

Mexico, Mexico City—Southern Pacific Railway of Mexico, Mexico City, plans rehabilitation of system, buildings, shops, yards, rail lines, bridges, dumps, earthwork, drainage, grades, water facilities, etc. **$28,500,000**.

Mexico, Saltillo—National Railways of Mexico, Bolivar, 19, Mexico City, plans railroad cars factory. **$4,000,000**.

Mexico, Villahermosa—Mexican Govt., Sria. de B. N., Mexico City, attent: Ing. Pedro Pablo Romero, plans federal bldg. $350,000.

Trinidad, Arima—Safie Brothers Co. Ltd., Port of Spain, plans factory, $2,000,000.

Trinidad, Port of Spain—Govt. of Trinidad, Port of Spain, plans island wide electricity scheme, $6,000,000; island wide water proj., $14,724,000.

Trinidad, Port of Spain—Stapled Boxes Ltd., Port of Spain, plans factory, $350,000.

Trinidad, San Fernando—Govt. of Trinidad, Port of Spain, plans hospital, $1,197,000.

PUBLIC BUILDINGS

Ala., Columbiana—HOUSING—Columbiana Housing Auth., Columbiana, 66 housing units, **$400,000**.

Calif., Clovis—SCHOOLS—Wolters Elementary School Dist., 1172 3 St., Clovis, plans by Wm. Hastrup, 319 Anglo Bank Bldg., Fresno, two 42,393 sq. ft. elementary schools. Approx. **$600,000**.

Calif., Corcoran—SCHOOLS—Corcoran Union Elementary School Dist., Corcoran, **$500,000** bond election Oct. 17, John C. Cremont School addn., $353,722; South School addn., $386,799; Central School addn., $292,099; New Airport School, $485,963; new Corcoran Junior High School, $662,732. CD 10/21/48.

Calif., Hanford—SCHOOLS—Hanford City School Dist. 1208, Camerson St., Hanford, **$694,000** bond election Oct. 17, schools.

▲ **Colo., Colorado Springs**—POWER PLANT—City, City Hall, plans by Lutz & May, Finance Bldg., Kansas City, Mo., 1 story bsmnt., rein.-con. power plant incl. generator bldg., boiler room and turbine, **$2,500,000**.

▲ **Fla., Key West**—HOUSING—Key West Housing Auth., c/o Steward & Skinner, 223 S.E. First St., Miami, 170 housing units. Approx. **$1,000,000**. CD 1/6.

Ill., North Chicago—SCHOOL—North Chicago School Dist. No 64, North Chicago, grade school, **$400,000**.

Mich., Big Rapids—SCHOOL—State, A. N. Langius, dir., State Admin. Bd., State Office Bldg., plans by Roger Allen & Assoc., 1126 Grand Rapids National Bank, Grand Rapids, brick, steel school at Ferris Institute. **$900,000**.

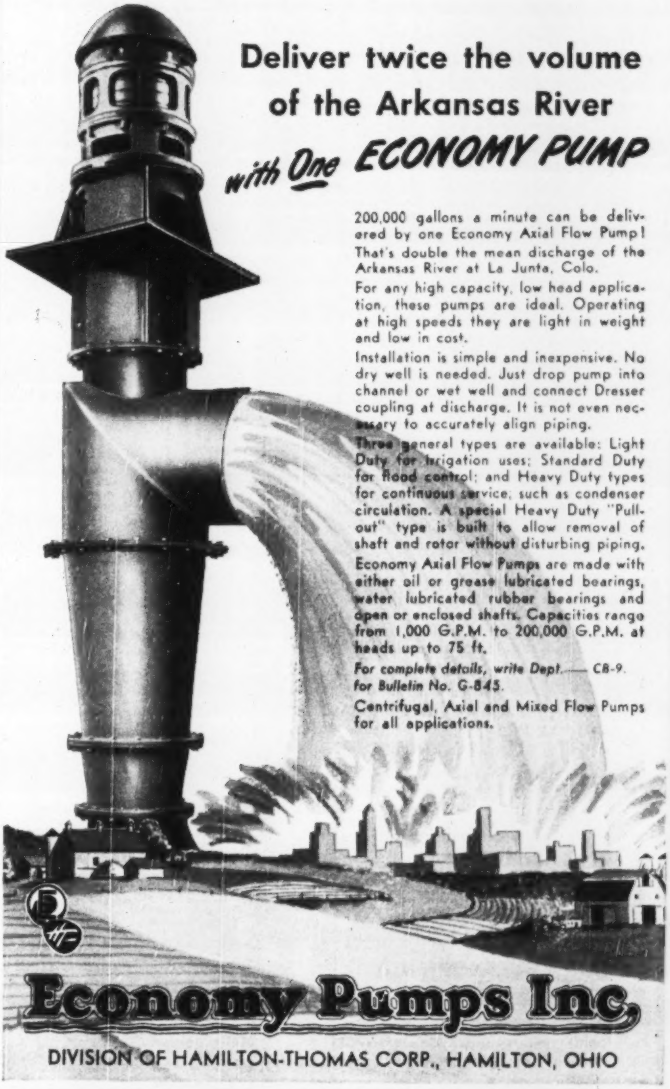
N. J., Elizabeth—HOSPITAL WING—Elizabeth General Hospital, 925 E. Jersey St., Elizabeth, plans by Albert A. Kaufman, 252 N. Broad St. addnl. wing to existing hospital **$438,321**. CD 3/11/43.

▲ † **N. M., Los Alamos**—BARRACKS—U. S. Eng., P. O. Box 1835, Albuquerque, barracks, near here, White Sands Proving Grounds. **$2,400,000**.

▲ **O., Barberton**—SCHOOLS—Bd. Educ. **$2,000,000** bond election Nov. 7, schools, Junior High School and addns. to existing schools. CD 11/15/45.

▲ **O., Fremont**—SCHOOLS—Bd. Educ., Fremont, Stamm school, **$509,713**; Hayes School, **$430,300**; Atkinson School, **$335,360**. CD 3/11/46.

S. C., Charleston—SANATORIUM—Charleston County Tuberculosis Assoc., The Center, plans by Simons &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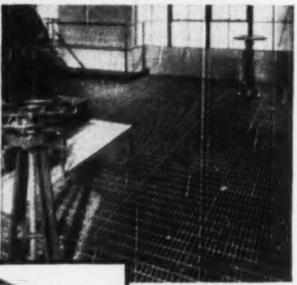

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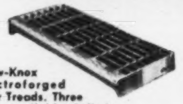

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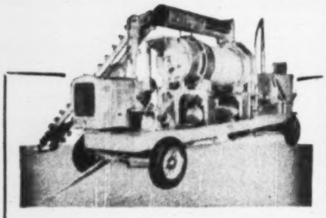

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BOX 186 MERCER, PENNA.

Lapham, 17 Broad St., tuberculosis sanatorium. $800,000. CD 8/29/49.

Tex., Abilene—DORMITORIES—Board for Texas State Hospitals and Special Schools, 45 and Lamar Sts., Austin, plans by Walter C. Moors, supv. archt. for Bd. and David S. Castle Co., 1082½ First St., women's dormitory, $275,000; men's dormitory, $300,000.

Tex., Garland—SCHOOL—Garland Independent School Dist., voted bonds Aug. 22, elementary school addn., $400,000.

Tex., Mexia — DORMITORIES — Board for Texas State Hospitals and Special Schools, 45 and Lamar Sts., Austin, plans by Wiltshire & Fisher, 4702 Ross St., Dallas, masonry men's dormitory, $300,000; women's dormitory, $300,000.

Utah, Lehi — SCHOOL — Alpine School Dist., American Fork, plans by Lawrence D. Olpin, 521 Kiesel Bldg., Ogden, elementary school. $400,000.

Utah, Orem—SCHOOL—Alpine School Dist., American Fork, plans by Claude S. Ashworth, 44 W. 2nd North St., Provo, school. $400,000.

Wash., Randle—SCHOOL—School Bd., Randle, plans by Lea, Pearson & Richards, 329 Tacoma Bldg., Tacoma, rebuild high school, $400,000.

Ont., Dutton—SCHOOL—West Elgin Dist. High School Bd., Dutton, 14 room high school. $430,000. CD 4/12/46.

Ont., Goderich—SCHOOL—Goderich Dist. High School Bd., Arthur Grange, chn., Goderich, high school. $498,000.

Ont., Kenora—HOME—Kenora District Municipal Assn., A. Wren, Sioux Lookout, Home for Aged at east limits of town. Approx. $400,000.

Ont., London—HOME FOR AGED—City Council, George Wenige, mayor, London, plans by T. C. McBride, City Hall, Home for Aged, 55 acre site on Wellingron Rd. South, $500,000.

Ont., West Lorne—SCHOOL—West Elgin District High School Bd., G. L. Martin, secy., 14 room central high school. $430,000. CD 5/13/49.

COMMERCIAL BUILDINGS

Ala., Mobile—CHURCH—Government Street Presbyterian Church, c/o W. March, 114 St. Joseph St., Mobile, church renovations, $250,000.

Calif., Riverside—CLUB—Benevolent Protective Order of Elks, 643 410 Main St., plans by Allison & Rible, 625 S. Westmoreland St., Los Angeles, 2 story, 150x114 ft. rein.-con. club. $250,000.

▲ **Colo., Denver**—OFFICES—Texas Co., University Bldg., Denver offices, E. 16 Ave. and Grant St., $1,000,000.

Ill., Chicago—DORMITORY—American Institute of Baking, 223 E. Ontario St., 3 story, bsmnt., dormitory for students of Institute. $350,000.

Ill., Chicago—RETAIL STORE—Sears, Roebuck & Co., North Ave. corner Harlem St., 3 story, retail store, $900,000.

Kan., Hutchinson—SCHOOL—St. Teresa's Parochial School, 5 and Poplar Sts., plans by McCrackin & Hiett, Hutchinson, school. $260,0000.

Mass., East Boston—CONVENT—Our Lady of Mt. Carmel R. C. Church, Rev. Louis L. Pastor 128 Grove St., 3 story, bsmnt., brick, steel convent.

Mich., Detroit—CHURCH—Episcopal Diocese of Michigan, Rts Rev. Richard S. Emrich, STD, 1 story, bsmnt., brick, stone church, Joy Rd. near Ford Cemetery.

Mich., Cutlerville—NURSES HOME—Christian Psychopathic Hospital, Bd. Trustees, Cutlerville, plans by J. & C. Daverman Co., Keeler Bldg., Grand Rapids, 4 story, brick, steel nurses home, $250,000.

Minn., Shakopee—HOSPITAL—St. Francis Hospital, c/o St. Mary's Home, 1925 Norfolk St., St. Paul, plans by H. H. Swanson, 500 Sexton Bldg., Minneapolis, 50-bed hospital, $600,000.

Mo., St. Joseph—THEATRE—Dickinson Operating Co., Inc., Glen W. Dickinson, pres., Mission, Kan., 1000-seat rein. con. brick, steel motion picture theatre at 111 North 9 St., $250,000.

▲ **Mo., St. Louis**—HOTEL—Olive Realty Co., c/o Herman C. Waldman, St. Louis Fire Door Co., 400 Withers Ave., zone 7, 14 story, bsmnt., rein. con. brick, steel fireproof apartment hotel on site 63x106 ft., 14 and Olive Sts. $1,000,000.

Mo., Webster Groves (St. Louis 19, P. O.)—SUPER MARKET—Bettendorf's Select Foods, Inc., c/o Hampton Village Market, Chippewa St. and Hampton Ave., St. Louis, Zone 9, plans by Wischmeyer & Lorenz, 911 Locust St., St. Louis, Zone 1, super market on 200x300 ft. site Big Bend Blvd. and South Elm Ave., $250,000.

Neb., Lewellen—HOSPITAL—Lewellen Community Hospital, Lewellen, hospital $250,000.

Neb., Lincoln—HOME—Martin Luther Home Society, Inc., c/o Davis & Wilson, archts., Stuart Bldg., Martin Luther Home. $250,000.

N. J., Trenton—APARTMENT HOUSE—Louis H. Cohan & Co., 881 Parkside Ave., apartment house on Edgewood Ave. between Lee Ave. and Westfield Ave., $600,000.

O., Cleveland—TEMPLE—Euclid Avenue Temple, Rabbi Barnett R. Brickner, 8206 Euclid St., plans by Percival Goodman, 19 E. 48 St., New York, N. Y., temple on Fairmont Blvd. near Green Rd. in Beachwood Village. Sigmund Braverman, Euclid 71st Bldg., Assoc. archt.

O., Dayton—BANK—Homestead Loan & Savings Assn., C. G. Feiock, pres., 21 E. 3 St., 2 story 70x171 ft.

bank at southwest corner of W. Second and Wilkinson Sts. **$275,000.**

▲ **O., Dayton**—SHOPPING CENTER—Herbert Huber, 69 E. Thurston St., shopping center, east side of Far Hills Ave between Rockhill Ave. and Lincoln Park Blvd. **$5 000,000.**

▲ **Pa., Phila.**—CLUB—Order of Sons of Italy in American, Grand Lodge of Penna, 1409 Tasker St. Phila., plans by Frank L. Petrillo, 1411 Walnut St., club, **$2,500,000.** CD 11/7/47.

Pa., Phila.—SUPER MARKET—Penn Fruit Co., 1919 Chestnut St., plans by Thalheimer & Weitz, 1325 Walnut St., super market, 19 and Cheltenham Ave. Approx. **$250,000.** CD 3/30.

Tex., Ft. Worth—SHOPPING CENTER—Baker Brothers Co., 105 N. Chandler St., plans by J. Russell Lee, c/o Forest Hill, conc. slab fdn., masonry shopping center in Richland Hills, **$250,000.**

Tex., Fort Worth—DWELLINGS—Western Land & Constr. Co., 6620 Camp Bowie St., Fort Worth, 55 dwellings in Ridglea West Addn., **$300,000.**

▲ **Tex., Houston**—DWELLINGS—A. E. Bailey, 3016 Jarrard St., 175 dwellings, in Reid Terrace, off Reid Rd. **$962,500;** 100 frame dwellings, concrete slab fdn., in area of Sunnyside Gardens. **$525,000.**

Tex., Houston—DWELLINGS—Brace & Carruth, 726 Garden Oak Blvd., 35 addnl. dwellings on Candlelight St., **$250,000.**

▲ **Tex., Houston**—HOSPITAL—Lee C. Gammill, 210 Emerson St., Administrator, plans by Milton F. Martin, Francis J. Niven, & Dale S. Cooper, 420 Sul Ross Ave., engrs. and archts. masonry 100-bed childrens hospital (in Texas Medical Center). **$1,000,000.**

Tex., Houston—HOUSING—Lynwood Corp., c/o Earl Gregg, 2620 Bissonnet St., 45 addnl. frame, masonry housing units, area of Gregg Terrace, **$375,000.**

Tex., Houston—DWELLINGS—Pleasantville Homes, Inc., 6205 Almeda Rd., eighty-two dwellings in Sec. 3, Pleasantville addn. north of Clinton Dr. and thirty-eight dwellings in Sec. 4 of Pleasantville addn. north of Tilghman St., $560,000 and $275,000 respectively.

Tex., Houston—DWELLINGS—Phillip G. Willard & Assoc., 3940 Main St., plans by Phillip G. Willard, 3940 Main St., fifteen concrete, masonry high type dwellings, **$600,000.**

Tex., Midland—RESIDENCES—Hays Constr. Co., 415 W. Texas St., 30 frame type residences, **$265,000.**

Tex., San Antonio—GROCERY, SUPERMARKET—H. E. Butt Grocery Co., 600 Roslyn Ave., plans by Phelps & De Wees & Simmons, 1501 Majestic Bldg., 18,000 sq. ft. masonry grocery and supermarket, concrete slab fdn. 3221 W. Commerce St. **$250,000.**

Tex., San Antonio—DWELLINGS—Quincy Lee & Assoc., 814 Gunter Bldg., plans by Shoop & Roberts, 122 W. Olmos Dr., 50 dwellings off West Ave. Place. **$425,000;** 34 addnl. dwellings, on Byrnes, Oakley and Blakeley Sts. **$250,000.** CD 8/23, 8/25.

Tex., Snyder—TELEPHONE BLDG.—Southwestern Bell Telephone Co., 308 S. Akard St., Dallas, plans by Thomas, Jameson & Merrill, 820 N. Harwood St., Dallas, 2 story bsmnt., brick hollow tile, limestone telephone bldg., concrete pier and beam fdn. **$250,000.** Zumwalt & Vinther Mercantile Sec. Bldg., Dallas, consult. engrs.

Tex., Velasco—DWELLINGS—Lone Star Constr. Co., Freeport, 62 frame dwellings in Riverside Terrace, **$427,000.**

Tex., Waco—RESIDENTIAL PROJECT—Federated Constr. Co., Waco, frame residential project, **$250,000.**

▲ **Wash., Spokane**—HOTEL—Dessert Hotel Co., Dessert Hotel, plans by V. L. Wulff, Great Northwest Life Bldg., Spokane, 62-unit highway hotel west of here, **$1,000,000.**

Wyo., Powell—HOSPITAL—Powell Hospital Assn., Powell, plans by Orr Pickering & Assocs., Fratt Bldg., Billings, Mont., hospital, **$250,000.**

INDUSTRIAL BUILDINGS

Ala., Birmingham—WAREHOUSE, OFFICE—Westinghouse Electric Corp., c/o Lawrence S. Whitten, Brown-Marx Bldg., Birmingham warehouse and office, Approx. **$300,000.** CD 6/30.

▲ **Ala., Gorgas**—STEAM GENERATING PLANT—Alabama Power Co., 600 N. 18 St., Birmingham 7th unit, steam generating plant. **$10,000,000.**

Ala., Mobile—GRAIN ELEVATOR—Alabama Elevator Co., c/o Thomas B. Allen, Matthews, Mo., grain elevator, Approx. **$300,000.**

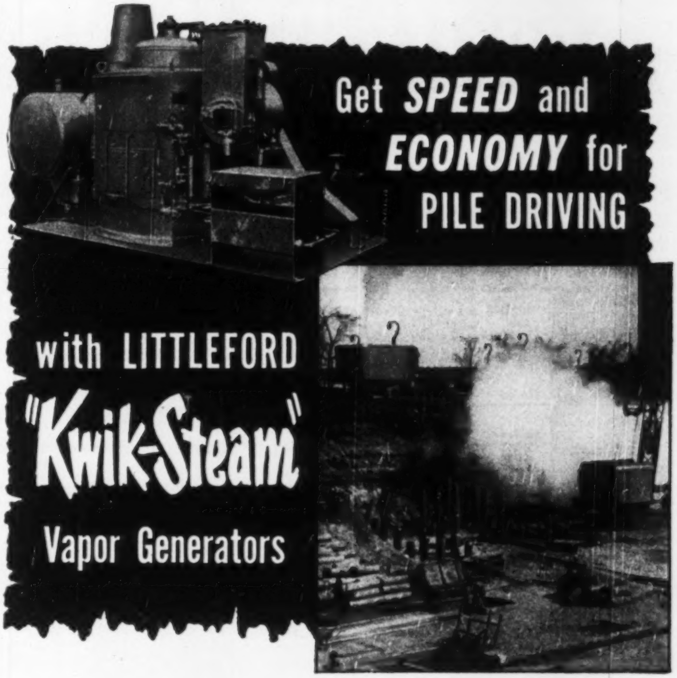
▲ **Conn., New London**—PLANT—Dow Chemical Co., Midland, Mich., plastic plant, 10 mi. north of here. **$1,000,000.**

▲ **Mich., Grand Rapids**—PAPER FACTORY—American Box Board Co., 470 Market Ave., paper factory. **$1,000,000.**

▲ **Minn., Hopkins**—PLANT—Merchants Refrigeration Co., 17 Varick St., New York, N. Y., 1 story 240x520 ft., brick cold storage plant, **$1,250,000.**

Minn., Minneapolis—GARAGE—Downtown Auto Park, Inc., L. Wakefield, pres., c/o First National Bank, 4 story, parking garage at Marquette Ave. and Fourth St., **$500,000.**

▲ **Mo., St. Louis Co.**—PLANT—McDonnell Aircraft Corp., Lambert, St. Louis Municipal Airport, Zone 21, brick, rein.-con., steel aircraft plant addn. **$2,500,000.**



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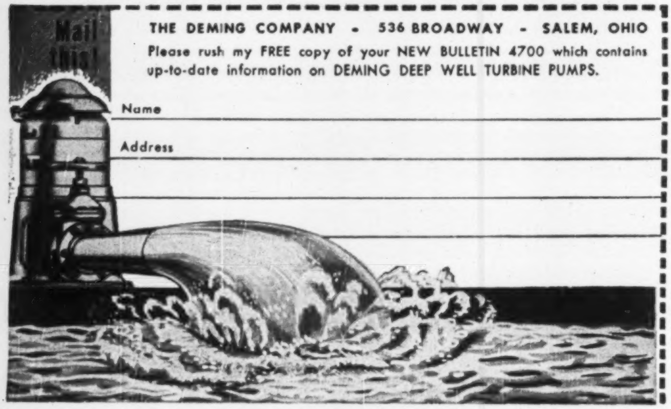

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▲ **N. Y., Albany**—PLANT—Tobin Packing Co., 900 Maple St., Rochester, 4 story plant addn. **$1,500,000.**

Okla., Oklahoma City—PLANT—American Iron & Machine Works, 312 N. Indiana St., Oklahoma City, Zone 4, drilling pipe processing plant S.E. 8 and High Sts. **$300,000.**

▲ **Tex., Colorado City**—POWER PLANT—Texas Electric Service Co., Colorado City, doubling capacity existing electric power plant, incl. 40,000 volt steam-electric generating unit. **$1,000,000.**

Tex., Fort Worth—BAKERY—Mrs. Baird's Bakery, 1701 Summit St., plans by Wilson & Patterson, 202 Majestic Bldg., 1 and 2 story steel frame addnl. bakery unit, rein.-con. beam fdn. **$200,000.**

Tex., Houston—WAREHOUSE and SHOPS—Grocers Supply Co., Inc., 11 No. Jackson St., 300x500 ft. warehouse and office on 13 acre tract on Holcomb Blvd. and commercial shops on 13 acre tract on Holcombe Blvd. **$550,000** and **$375,000** respectively.

▲ **Utah, Salt Lake City**—POWER PLANT—Utah Power & Light Co., Kearns Bldg., 75,000 kilowatt, steam turbo-generator electric power plant. **$10,500,000.** J. A. Hale, c/o owner, ch. engr.

▲ **Ont., Toronto**—FACTORY—Canada Foils Ltd., 7 Fraser Ave., factory in new industrial site in Scarborough Twp. Approx. **$2,000,000.**

Ont., Toronto—PLANT, etc.—Canada Glazed Paper Ltd., 45 McMurrich Ave., plant and office in industrial area in Scarborough Twp. Approx. **$800,000.**

Ont., Toronto—PLANT—Trailmobile (Canada) Ltd., 401 College St., plans new industrial area in Scarborough Twp. Approx. **$300,000.**

▲ **Que., Shawinigan Falls**—PLANT ADDN.—Canadian Industries Ltd., 1135 Beaver Hall Hill, Montreal, constr. plant addn., and installing equip. Approx. **$1,500,000.** I. R. Tait, c/o owner, engr.

UNCLASSIFIED

▲ **Alabama and Florida**—ELECTRICAL TRANSMISSION LINE—Alabama Power Co., 600 N. 18 St., Birmingham, Ala., electrical transmission line from Mobile, Ala., to Pensacola, Fla., **$1,000,000.**

▲ **Colo., Denver**—FREIGHT YARDS, etc.—Chicago, Rock Island & Pacific R.R. Co., W. B. Throckmorton, ch. engr., LaSalle St. Station, Chicago, Ill., freight wards imprvs. and extens. incl. 4 mi. new tracks and underpasses. **$1,000,000.**

Md., Baltimore—GRANDSTAND—Maryland Jockey Club, Alfred Gwynne Vanderbilt, chn., Pimlico Race Track, plans by Palmer, Fisher, Williams & Nes, 1020 St. Paul St., concrete, steel grandstand, **$700,000.**

Mo., Jennings (St. Louis 20, P.O.)—DRIVE IN THEATRE—Clarence Kaimann, c/o Kaimann Bocking Offices, St. Louis, Zone 15, 750-car drive in motion picture theatre on site fronting 875 ft. on W. Florissant Ave. and 1500 ft. on Lucas and Hunt Rd., **$100,000.**

▲ **Mo., St. Louis**—FREIGHT YARD—Wabash Railroad Co., A. K. Atkinson, pres., J. C. Bousfield, ch. engr. Railway Exchange Bldg., 611 Olive St., Zone 1, railroad freight yard in North St. Louis between Branch St. and North Market St., Hall and First Sts., also constr. or relocation grade crossings on North Market, Second, Palm, Branch, Deck, Buchanan and Angelrodt Streets, **$1,000,000.**

Oklahoma — RURAL DISTRIBUTION LINES — Cimarron Electric Co-operative, Kingfisher, 110 mi. rural distr. lines remodeling headquarters facilities. **$205,000.**

Okla., Muskogee—PARK IMPRVS.—City, Muskogee, defeated bonds, park imprvs. **$115,000.** Benham Engr. Co., American Natl. Bldg., Oklahoma City, consult. engr. CD 7/18.

Okla., Pryor—STEAM TUNNEL, SWIMMING POOL—Board of Affairs, Capitol, Oklahoma City, steam tunnel at the Whittaker Orphans Home, **$50,000;** swimming pool, **$50,000.** Collins & Gould, McBirney Bldg., Tulsa, consult. engrs.

▲ **Texas, New Mexico, Arizona, California**—OIL PIPE LINE—West Coast Pipe Line Co., c/o R. J. Bradley, pres., 4012 Marquet St., Dallas, Tex., 986 mi. 20 in. welded joint crude oil pipe line carrier between vicinity Monahans, Tex. to vicinity Los Angeles, Calif., 200,000 bbls. daily capacity. **$66,000,000.**

Tex., Longview—PARK—City, Longview, municipal park and playgrounds. **$125,000.** Julian Montgomery, Littlefield Bldg., Austin, consult. engr. CD 6/9/48

Tex., San Antonio—BUYERS DOCKS, etc.—San Antonio Produce Terminal Market Corp., Joe J. Barshop, pres., 310 Produce Row, plans by De Haven Pitts, Travis Bldg., 50 out-of-town buyers docks, in area outside terminal bldg., **$175,000;** railway spur tracks sys. for Terminal and Market Zone, **$80,000.** W. W. Orrison Engrs., Travis Bldg., consult. engrs.

▲ † **Wash., Seattle**—PIER—Yards & Docks Annex, Navy Dpt., Arlington, Va., repair Pier 91 for Military Sea Transportation Service, **$1,400,000.**

▲ † **Alaska**—COMMUNICATIONS—U. S. Eng. (APO 942, c/o PM, Seattle, Wash.), Anchorage, classified project dealing with communications at unnamed site. **$9,205,940.**

▲ † **Alaska, Anchorage**—UTILITIES, etc.—U. S. Eng., Anchorage, utilities, warehouses and roads at Fort Richardson, **$16,325,000.** Col. L. E. Seeman, dist.

† **Alaska, Kodiak**—WATERFRONT STRUCTURES—Yards & Docks Annex, Navy Dpt., Arlington, Va., repair waterfront structures, **$713,000.**

▲ **Man., Winnipeg**—BOULEVARDS—Greater Winnipeg Diking Bd., Winnipeg, constr. 15 mi. boulevards on either side of Red River. **$2.500.000.**

CONSTRUCTION REPORTS-Second Section

WATER SUPPLY

BIDS ASKED

Mich., Detroit—B.A. 9/19—Dpt. P. Wks., City Hall, Contr. PW 1401, 850 lin. ft. 12- to 30-in. sewer incl. 97 lin. ft. of twin 12 in. c.i. concrete incased siphon under Rouge River, located in Glenhurst and Grayfield Aves. CD 3/30/43.

† **Minnesota**—B.A. 9/28—U. S. Eng., 428 Federal Bldg., Milwaukee 1, Wis., Constr. automatic gage house and well at Warroad, Minn., Duluth Dist., CIVENG 47-013-51-5.

Tex., Gladewater—B.A. 9/30—City, Gladewater, WW extens. $60,000. Joe E. Ward, Nacol Bldg., Wichita Falls, engr. Otto Staerker, Gladewater, assoc. engr.

SEWERS, WASTE DISPOSAL

BIDS ASKED

Pa., Phila.—B. A. 9/18—Gulf Oil Corp., 30 St. and Penrose Ave., storm and sanitary sewers. Approx. $50,000. R. C. Roether, c/o owner, engr.

Tex., San Antonio—B. A. 9/21—City, City Hall, Military Plaza, sewage lift station, appurtenances for west side sewer main. $50,000. Plans deposit $12.50. Beavers-Ashford Corp., 1505 Transit Tower, engrs. CD 12/15/47.

Tex., Rosenberg—B. A. 9/26—City, sanitary sewer collection lines, lift station, enlarge treatment plant, etc. $130,000. S. A. Russell, Rosenberg, engr. CD 8/8.

Tex., Gladewater—B.A. 9/30—City, Gladewater, sanitary sewer extens. $75,000. Joe E. Ward, Nacol Bldg., Wichita Falls, engr. Otto Staerker, Gladewater, assoc. engr.

BRIDGES

BIDS ASKED

STATE HIGHWAY LETTINGS

September 19
Massachusetts
Virginia
September 21
Kansas

September 27
California
Rhode Island
September 29
Georgia

LOW BIDDERS

▲ † **Tennessee**—Tennessee Valley Auth., Chattanooga, highway bridge across Chickamauga Dam over Tennessee River, near Chattanooga, from American Bridge Co., Union Trust Bldg., Cincinnati, O. **$3,352,100.** Est. $2,380,000. CD 8/15, under Tenn., Chattanooga.

CONTRACTS AWARDED

▲ **New Jersey**—New Jersey Turnpike Auth., Trenton, Contr. No. 40, grading, drainage, paving and an interchange structure at Route 44, removing existing bridge and a new crossing of Salem Canal and an underpass at Salem County Route 16, Salem Co., to S. J. Groves & Sons Co., State Hy. 35, Woodbridge, **$1,179,971**. Bids 8/8. CD 8/10, under LB.

STREETS AND ROADS

BIDS ASKED

STATE HIGHWAY LETTINGS

September 19
Maryland
September 20
Louisiana

September 21
Kansas
September 27
California

Calif., Los Angeles—B.A. 9/26—Los Angeles County Bd. Supervs., 501 Hall of Records, imprv. 120 St., Crenshaw to Prairie Sts., Hawthorne. Approx. $50,000. Plans deposit $5. C. E. Arnold, co. engr.

La., Cameron—B.A. 9/26—Cameron Parish Police Jury, office of Joseph W. Doxey, Cameron road work, approx. 8.2 mi. excav. in Cameron Parish, beginning approx. 3¼ mi. west of Johnson Bayou School to Sabine Lake. Plans deposit $30, no refund. M. D. Gates, 1745 Seventh St., Port Arthur, Tex., consult engr.

CONTRACTS AWARDED

California—State Div. Hys., Pub. Wks. Bldg., Sacramento, grading, plant mix on untreated rock surf. 7.1 mi., 2 mi. east of Los Angeles-Ventura County line and 1 mi. west of Moor Park Rd., Los Angeles and Ventura Counties, to Fredericksen & Kasler, 212 14 St., Sacramento, **$823,335**. Bids 8/3. CD 8/11, under LB.

EARTHWORK, WATERWAYS

BIDS ASKED

† **Louisiana**—B.A. 9/20—U. S. Eng., foot of Prytania St., New Orleans, Zone 6, approx. 1,350 lin. ft. standard board revetment on Red River, Red River Parish, Inv. 51-29; approx. 33,000 cu. yd. semi-compacted earthwork on Miss. River Levees, Plaquemines Parish, Inv. 51-30; constr. Reach 6 of Bayou Rapids Bouef and Cocodrie Proj., 23,000 cu. yd. excav. clearing and snagging 2.15 mi. existing channel and installing one 42 in. corrugated metal culvert, Rapides Parish, Inv. 51-31.

† **California**—B.A. 9/26—Bureau Reclamation, Dpt Interior, Denver, Colo, furnishing portland cement and pozzolan or portland-pozzolan cement for Cachuma Dam, Cachuma Proj., Spec. No. 3172., adv. ENR. 9/14.

LATIN AMERICA

Brazil—National Railway Dept., Rio de Janeiro, receiving bids October 16, pilings, piers and abutments for 1,375 meter long highway-railway bridge across the Rio Sao Francisco to connect towns of Proprio and Colegio. Total est. $6,150,000; substructure est. $2,950,000. O. Machado da Costa, engr. CD 8/18/49.

PUBLIC BUILDINGS

BIDS ASKED

Conn., Norwalk—SCHOOL—B. A. 9/19—City, Bd. Educ., brick, steel, concrete school. $400,000. Plans deposit $40. Gelroy & Eaton, 64 Wall St., archts. CD 3/24.

▲ **N. Y., Rome**—HOUSING—B.A. 9/19—Housing Auth., City Hall, housing, Liberty and N. Levitt Sts., $1,820,000. Kinney & Pennock, 7 Hopper St., Utica archts.

Tex., Hebbronville—SCHOOL—B.A. 9/19—Jim Hogg Independent School Dist., Hebbronville, school addns. and remodeling. $375,000. Plans deposit $25. Hamon & Co., 715 N. Tancahua St., Corpus Christi, archts. Frank T. Drought, 117 W. Pecan St., San Antonio, engr. CD 7/27.

† **Ky., Fort Knox**—BUILDINGS—B.A. 9/20—U. S. Eng., 830 W. Broadway, Louisville, Zone 2, structural steel tower, water supply and distr. sys., sanitary sewer sys., storm drains, culverts, electrical distr. sys., etc., $500,000. Plans deposit $50.

Mich., Hartland—SCHOOL—B.A. 9/20—Hartland School Dist., P. R. Allmand, secy., Bd. Educ., Hartland, 2 story bsmnt., brick, steel, elementary school. $300,000. Plans deposit $50. Bennett & Straight, 15624 Michigan Ave., Dearborn, archts.

Ont., Walkerton—SCHOOL—B.A. 9/20—Walkerton District High School Bd., Walkerton, 1 story 180x320 ft., brick, tile high school, $300,000. S. B. Coon & Son, 4 St. Thomas St., Toronto, archts. CD 1/23.

▲ **Que., Ste. Foy**—HOSPITAL—B.A. 9/20—C. A. Narraway, act, secy. c/o Dpt. P. Wks., Ottawa, Ont., construct Veterans Hospital, Phase No. 4, superstructure, less structural steel. Approx. $1,500,000. Plans deposit $200. G. Brault, c/o owner, archt. CD 1/21/48.

N. Y., Long Island City—HOUSING IMPRVS.—B.A. 9/22—New York City Housing Auth., 63 Park Row, New York Zore 7, street and yard imprvs. and topsoil and planting from Ravenswood Houses Sect. II (Proj. No. NYC-20) in area bounded by 12 St., 34 Ave., 35 Ave., 21 St. and 36 Ave. Plans deposit $25 each. CD 7/5 and 7/20.

N. Y., New York—HOUSING IMPRVS.—B.A. 9/22—New York City Housing Auth., 63 Park Row, Zone 7, topsoil and planting for Lexington Houses (Proj. No. NYC 21) in area bounded by E. 98 St., 3 Ave., E. 99 St., Lexington and Park Aves. Plans deposit $25.

Calif., Los Angeles—LAUNDRY—B. A. 9/26—Los Angeles County Bd. Supervs., 501 Hall of Records, laundry at Rancho Los Amigos, Hondo. C. E. Arnold, co. engr. CD 1/17/49.

Ore., Portland—SCHOOLS—B. A. 9/26—Multnomah School Dist. 1, 631 N. E. Clackamas St., 1 story wing for Franklin High School. $350,000. Plans deposit $50, Herzog & Barnes, Henry Bldg., archts., CD 5/2. 16-room concrete George School, Plans deposit $50, Donald W. Edmundson, Henry Bldg., archt. CD 6/1/44.

Tex., Corpus Christi—SCHOOL—B. A. 9/26—West Oso Independent School Dist., c/o W. E. Hall, 4113 Ramsey St., school. $300,000. Wade, Gibson & Martin, 921 Prof. Bldg., archts. CD 5/25.

Tex. Dallas—HIGH SCHOOL—B. A. 9/26—Dallas Independent School Dist., Akard and Royal Sts., Rusk Junior High School, Inwood Rd. and Denton Dr. $900,000. Plans deposit $50. Mark Lemmon, 1210 Main St., bd. archt.

LOW BIDDERS

▲ **Calif., Berkeley**—SCHOOLS—Berkeley Unified School Dist., 1414 Walnut St., Aug. 31, 2 story steel, rein.-con. Franklin and Jefferson Schools, from Parker, Steffens & Pearce, 135 S. Park St., San Francisco, **$1,506,500**. CD 8/3, under LB.

▲ **Fla., Orlando**—SCHOOLS—Orange County Bd. Pub. Instruction, Orlando, rejected bids Aug. 26, North and South Orlando High Schools. L. B. **$2,512,000.** CD 9/5, under LB.

Pa., Doylestown—SCHOOL—Public School Building Auth., 1400 N. Cameron St., Harrisburg, Aug. 31, general constr. secondary school for Pennsbury Joint School Board, Lower Makefield Twp. from Belli Co., Broad Street Bank Bldg., Trenton 8, N. J., **$858,700**. CD 7/31.

▲ **Tex., Houston** — COURTHOUSE, etc. — Harris Co., Courthouse, Aug. 31 (a) general contract, (b) heating, plumbing, air-conditioning (c) electrical work, (d) electrical passenger freight elevator (e) steel jail

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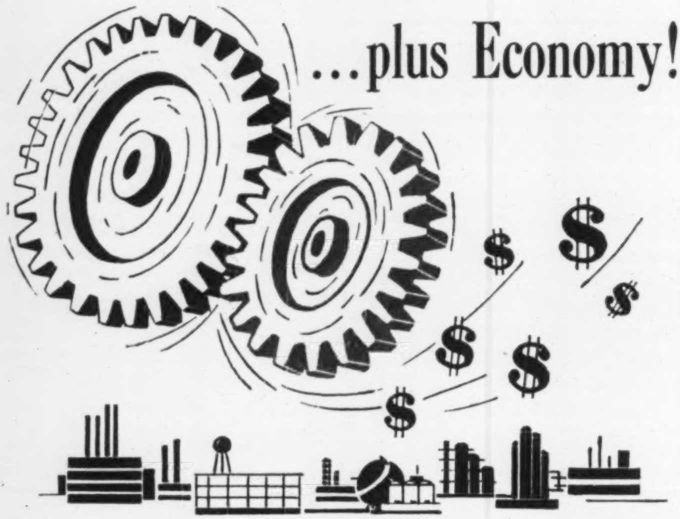

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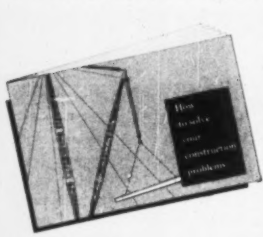

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Tex., Houston—SCHOOL—Houston Independent School Dist., 1600 Washington St., Aug. 25, Yates School, incl. 18-room school unit, etc., from Marshall Constr. Co., 4009 Center St. **$978,400**. CD 7/27.

Wash., Seattle—YOUTH SERVICE CENTER—King Co., County-City Bldg., Zone 4, general contract youth service center to replace juvenile court and detention home, from J. C. Boespflug Co., 1912 4 Ave., S., Seattle, **$795,327**. CD 8/14.

CONTRACTS AWARDED

Calif., Fresno—DEMONSTRATION SCHOOL, etc.—State Div. Architecture, P. Wks. bldg., Sacramento, general contract, 88,000 sq. ft., rein.-con. mens gym., demonstration school and industrial arts bldgs. at Fresno State College, to Pacific Coast Builders, 2530 18 St., San Francisco, **$842,823**. Bids 8/8. CD 8/16, under LB.

▲ **Calif., San Anselmo** — SCHOOL — Tamalpair Union High School Dist., Route 2, Box 30, Mill Valley, steel, rein.-con. Sir Francis Drake High School, to James I. Barnes Constr. Co., 299 Kansas St., San Francisco, **$1,799,708**. Bids 8/31. CD 8/8.

Idaho, Idaho Falls—SCHOOL—School Bd. Senior High School, 2 story, steel, rein.-con. high school on concrete piling, filter air-conditioning, to Arrington Constr. Co., Idaho Falls. **$927,881**. Bids 8/7. CD 8/30, under LB.

Md., Salisbury—HOSPITAL—Peninsula General Hospital, Salisbury, hospital, boiler house, and addns. to present bldg., to Wm. F. Sutter, Schley St., Nescopeck, Pa., **$922,500**. CD 8/31, under LB.

Neb., Norfolk—HOSPITAL—State Bd. Control, Lincoln, administration and receiving bldg. at Norfolk State Hospital to A. Borchman & Sons, 4601 Douglas St., Omaha, **$959,797**. Bids 8/22. CD 8/29, under LB.

▲ **N. Y., East Williston**—SCHOOL—Bd. Educ., Union Free School Dist. 2, East Williston, school, Willets Rd., to Joseph Bisceglia & Sons, Inc., 13 Oakland Ave., Harrison. Total est. **$1,250,000**. Bids 7/27. CD 7/13.

▲ **Pa., Norristown**—HOSPITAL—General State Auth., 18 and Herr Sts., Harrisburg, general contract reconstruction Building (No. 12) for female working patients at Norristown State Hospital, to Wark & Co., 1920 Sansom St., Phila., **$1,261,000**. Bids 8/23, awarded 8/31. CD 8/28, under LB.

▲ **Tex., Dallas**—HIGH SCHOOL—Dallas Independent School Dist. c/o Bd. Educ., Akard and Royal Sts., South Oak Cliff High School, to Hal. C. Dyer, Lone Star Gas Bldg., **$1,117,150**. Bids 8/29. CD 7/20.

Wash., Seattle—STUDENTS UNION—University of Washington, Seattle, Zone 5, Aug. 31, general contract 1 and 2 story, bsmnt., 116x128 ft., 62x107 ft. and 30x56 ft. south addn., to Associated Students Union Bldg., from Henrik Valle Co., 407 3 Ave. W. **$933,259**. CD 8/10.

▲ **W. Va., Morgantown**—PHYSICS—West Virginia University, Morgantown, 4 story, bsmnt., steel, brick limestone physics bldg., to Baker & Coombs, 319 Demain St., Approx. **$1,337,700**. Bids 8/1. CD 8/16, under LB.

▲ **Wis., Milwaukee**—HOUSING—Milwaukee Housing Auth., 844 W. Market St., Zone 2, general contract Westlawn Housing (724 units), Proj. Wisc. 2-2, to Kroening Eng. Corp., 4500 W. Mitchell St., Zone 14, **$5,971,980**; plumbing, to S. V. Hanley, 1653 Farwell Ave., Zone 2, **$527,447**. CD 8/28, under LB.

▲ **Wis., Oshkosh**—HOSPITAL—Winnebago Co., Oshkosh, general contract 2 story bsmnt., rein.-con. brick, terra cotta or bedford stone county hospital, to George A. Fuller Co., 111 W. Washington St., Chicago, Ill., **$1,521,083**. Bids 8/3. CD 8/11, under LB.

▲ **Phillipine Islands**—CHEMICAL FERTILIZER WORKS, etc.—Government of the Phillipines, Manila, development of chemical fertilizer works and 25,000 kilowatt hydro-electric power plant in central Mindanao to Westinghouse Electric International Co., 40 Wall St., New York, N. Y., U. S. A. **$4;600,000**. CD 12/13/45.

COMMERCIAL BUILDINGS

BIDS ASKED

Ga., **Columbus**—CHURCH—B. A. 9/19—St. Paul Methodist Church, c/o James J. W. Biggers & Assocs., archt., Flowers Bldg., Columbus, church. Approx. $250,000. CD 11/25/49.

Mass., **Marblehead**—RESIDENCES—B. A. 9/19—Victor Trager, 606 Main St., Malden, fifty-two 1 story, bsmnt., cinder block, stucco, granite, brick residences. $900,000. Meyer Lewis, 294 Washington St., Boston, archt. CD 8/4.

N. J., **Fort Dix**—HOUSING—Bids Asked—Dpt. Army, North Atlantic Div., 12126 Federal Office Bldg., 90 Church St., New York, 7, N. Y., construct, manage and finance 300 housing units.

(Continued on page 108)

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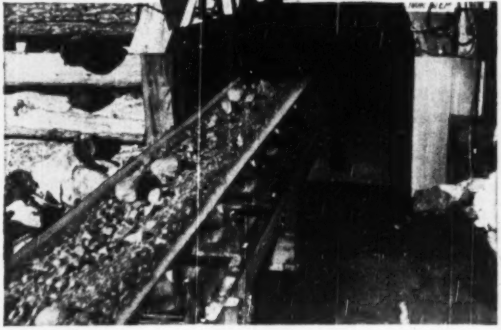

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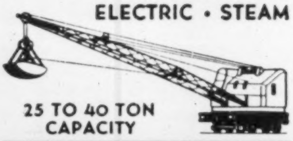

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(Continued from page 106)

SOON LETS CONTRACT

Pa., Phila.—HOSPITAL—Frankford Hospital, Frankford Ave. and Wakeling St., soon lets contract, hospital, new bldg., and addns. to present bldg. $900,000. Stopper & Lichty, 112 Spruce St., archts. Axel Schulze, 10 S. 18 St., engr. CD 8/24.

▲ **Pa., Pittsburgh**—HOSPITAL—St. Margaret Memorial Hospital, 46 St., soon lets contract, 4 story, bsmnt, brick, steel hospital addn. $1,000,000. Wm. Y. Cocken, 800 Century Bldg., archt. CD 7/17.

▲ **Pa., Scranton**—COLLEGE—Marywood College, 2300 Adams Ave., soon lets contract, 4 college bldgs. $1,000,000. Henry Dagit & Sons, 1329 Race St., Phila., archts. CD 8/29.

▲ **Wis., Green Bay**—SCHOOL—Sts. Peter & Paul Congregation, Green Bay, soon lets contract, parochial school, gymnasium, convent. $1,000,000. Feldhausen & Coughlin, Green Bay, archts. G. Feldhausen, Jr., Green Bay, engr. CD 8/1.

LOW BIDDERS

▲ **Pa., Pittsburgh** — SCHOOL — Carnegie Institute of Technology, Schenley Park, rejected bids Aug. 13, 4 story, bsmnt, brick, granite School of Industrial Admin. **$1,000,000**. Will re-advertise. CD 8/4.

▲ **Tenn., Memphis**—OFFICE—John T. Kimbrough, Jr., c/o Halsey & Hall, archts., Sterick Bldg., rejected bids Aug. 14, office. **$1,000,000**. CD 8/10.

▲ **Va., Danville**—NURSES HOME, HOSPITAL—The Memorial Hospital, c/o contractor, nurses home and hospital addns. and alterations from English Const. Co., Altavista. **$588,740** and **$2,450,400** respectively. Bids 8/24. CD 7/28.

CONTRACTS AWARDED

▲ **Calif., Beverly Hills**—HOTEL—Beverly Hills Development Co., 145 S. Rodeo Dr., 8 story hotel known as the Beverly Hilton, to be leased by the Hilton Hotels Corp. to Del E. Webb Constr. Co., 5101 San Fernando Rd., Los Angeles, Approx. **$4,500,000**. Wurdeman & Becket, 5657 Wilshire Blvd., Los Angeles, archts. CD 12/3/48.

▲ **Calif., Los Angeles**—DWELLINGS—Barhugh Estates, Inc., 9434 Long Beach Blvd., South Gate, 208 stucco dwellings, Victory Blvd., Gilmore, Hamlin, Haynes and Lemay Sts., to Biltmore Homes, Inc., 9434 Long Beach Blvd., South Gate, Approx. **$1,539,200**.

▲ **Calif., Whittier**—DWELLINGS—Craig Gardens, Inc., 1270 S. La Brea Ave., Los Angeles, 156 frame, stucco dwellings, Chatfield, Halray, Sorenson, Lynalou and Kingard Aves. Owner builds. **$1,008,690**. Kemmerer Eng. Co., 230 N. Comstock St., engr.

▲ **Ill., Calumet City**—RESIDENCES—Gold Coast Manor, c/o contractor, 6135 Hohman St., Hammond, Ind., two hundred and fifty 1 story, brick residences, to Central Constr. Co., 6135 Hohman St., Hammond, Ind., **$2,500,000**. A. J. Del Bianco, 5501 W. Irving St., Chicago, Zone 47, archt.

▲ **Ill., Chicago**—APARTMENT—Community Development Trust, 39 S. State St., Zone 3, thirty-five brick 694 unit apartment on 13 acre site E. 63 and S. Park Ave., Zone 37, to Patrick Warren Co., 815 N. Kedzie St., Zone 12, **$8,000,000**. Awarded 8/27. CD 5/26/49

Ill., Chicago—APARTMENT—Community Development Trust, 29 S. State St., Zone 3, 5 story 40 unit apartment, to John W. Harris Assoc., 134 S. La Salle St., Chicago, Zone 3. **$800,000**. Awarded 8/28. CD 5/26/49.

▲ **Ill., Chicago** — APARTMENT — 2933 Sheridan Road Bldg. Corp., c/o Pace Assoc., archts., 53 W. Jackson St., Zone 4, 14 story, 167x167 ft. 208 unit apartments, to Turner Constr. Co., 105 W. Adams St., Zone 3, **$2,000,000**. Awarded 8/28.

▲ **Mo., Kansas City**—APARTMENT—J. C. Nichols Co., 310 Ward Parkway, Zone 2, five 2 story, 128 unit apartment, Campbell and Harrison between Brush Creek Blvd. and 47 St., to Geo. C. Norton Constr. Co., 1016 Baltimore St., Zone 6, Approx. **$1,000,000**. CD 8/21.

N. J., Trenton—APARTMENT—Louis H. Cahan & Co., Market St. Natl. Bank Bldg., Phila., Pa., apartment development, Edgewood Ave., separate contracts, Approx. **$900,000**. Raymond Smythe, 12 N. Warren St., archt.

N. J., Trenton—RESIDENTIAL DEVELOPMENT—Rona Manor, Inc., 235 E. Hanover St., residential development, Nottingham Way, Hamilton Twp., separate contracts. Approx. **$880,000**.

Tex., Bellaire—DWELLINGS—Taylor Building Co., 401 Jensen Dr., Houston, 75 dwellings. Owner builds. **$875,000**. CD 8/18.

▲ **Alaska, Anchorage**—HOUSES—Union Constr. Co., Anchorage, 151 houses in View Ridge area, day labor. Approx. **$2,250,000**. CD 8/29.

Que., Quebec City—HOSPITAL—St. Michel Archange Board, Mastai, 45x222 ft. rein.-con. structural steel frame, stone, brick hospital addn. in Mastai, to Francois Marquis et Fels, Ltee., 177 Cremazie St. Approx. **$800,000**. P. Levesque, 130 Turnbull Ave., archt. CD 2/4/44.

INDUSTRIAL BUILDINGS

BIDS ASKED

Pa., Phila.—WAREHOUSE, etc.—B.A. 9/18—Gulf Oil Corp., 30 St. and Penrose Ave., warehouse and carpenter shop, Approx. $68,000; drum filling bldg., Approx. $68,000. R. C. Roether, c/o owner, engr. CD 5/27/48.

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Man., Winnipeg—SERVICEPARTS DEPOT—B.A. 9/21—Ford Motor Co. of Canada, 2780 Sandwich St., Windsor, Ont., 250x300 ft. brick, concrete service parts depot. $900,000. Austin Co. Ltd., 2 King St. East, Toronto, engr. CD 8/31.

CONTRACTS AWARDED

▲ **Fla., Plymouth**—WAREHOUSE—Central Florida Refrigerated Warehouse, Plymouth, 282x371 ft., 2,500,000 cu. ft. refrigerated warehouse, to Magham & Butler, Inc., 3128 Coral Way, Miami, **$1,000,000**, Harry M. Lobach, c/o owner, engr.

▲ **Mich., Plymouth**—FACTORY—Barnes-Gibson-Raymond Co., Plymouth, 1 story, brick, concrete, glass factory, Plymouth Rd., to Cooper Constr. Co., 5057 Woodward St., Detroit, Approx. **$1,400,000.** Giffels & Vallet, 1000 Marquette Bldg., Detroit, archts.

▲ **Miss., Hattiesburg**—PLANT—Hercules Powder Co., Delaware Trust Bldg., Wilmington, Del., texephine (insecticide) plant, to H. K. Ferguson Co., 1783 E. 11 St., Cleveland, Ohio, **$1,500,000.** CD 7/14.

▲ **Tex., Houston**—CHEMICAL PLANT—Ethyl Corp., c/o National Standard Bldg., to C. F. Braun & Co., 100 S. Freemont Ave., Alhambra, Calif., design and construction tetra-ethyl lead chemical plant unit, Approx. **$4,250,000**; ethyln chloride chemical plant unit, Approx. **$3,750,000**; sodium and chlorine chemical plant unit, Approx. **$5,500,000**; misc. chemical plant mfg. unit, Approx. **$6,500,000.** Grand total $20,000,000. CD 8/24.

▲ **Tex., Marshall**—BOOSTER STATION, etc.—Texas-Illinois Natural Gas Pipe Line Co., 20 N. Wacker Dr., Chicago, Ill., design and construction pipe line natural gas booster station and 20 residential units and pipe line maintenance warehouse, near here, to Fish Pipeline Constr. Co., M & M Bldg., Houston, Approx. **$1,000,000** and **$225,000** respectively. CD 6/9.

▲ **W. Va., Glasgow**—POWER PLANT—American Gas & Electric Co., and Appalachian Electric Power Co., 301 Virginia St. E., Charleston, steam electric power about 20 mi. from Charleston, Owner builds, **$40,000,000.**

UNCLASSIFIED

BIDS ASKED

† **W. Va., Point Pleasant**—SECURITY FENCE—B.A. 9/20—Pub. Wks. Office, Headquarters, Fifth Naval Dist., H. S. Naval Base, Norfolk, 11, Va., security fence at U. S. Naval Storehouse, Spec. 25118. Plans deposit $10.

▲ **Mass., Boston**—B. A. 9/21—Port of Boston Auth., Commonwealth Pier 5, Contr. 7, dredging filling, demolition on site of Pier 1 and Boston and Albany Pier 2, East Boston, $100,000, Plans deposit $50, Fay, Spofford & Thorndike, 11 Beacon St., engrs.; Contr. 8, constr. Pier 1, East Boston, over $1,000,000, Plans deposit $100. CD 12/30/47.

† **Washington**—SUB-STATION—B.A. 9/21—Bonneville Power Admin., 827 N. E. Oregon St., Portland, Ore., construct Port Angeles sub-station, Inv. 5331. Plans deposit $5.

LOW BIDDERS

▲ **New York**—RETAINING WALLS—President Queens Boro, Boro Hall, 120-55 Queens Blvd.; Kew Gardens, Zone 15, Aug. 29, grading, construct retaining walls, drainage facilities and grade separation structures, etc. in Connecting Hy. from Northern Blvd., to approx. 100 ft. north of 32 Ave. from Tully & DiNapoli, Inc., 30-11 12 St., Long Island City, **$1,440,656.** CD 8/25.

▲ **Pa., Phila.**—SUBWAY—Dpt. City Transit, City Hall Annex, High speed line, Market St. subway exten. (second sect.) from Buckley & Co., Inc., 1317 S. Juniper St., **$1,773,117.** Laurence Costello, Transit Dept. Dir. CD 11/9/44.

Wash., Seattle—TRANSFORMERS—City, County-City Bldg., Seattle, Zone 4, Aug. 25, 6 transformers for city light substation, from Ferranti, Ltd., London, England **$582,000**, est. $1,200,000. CD 7/18.

CONTRACTS AWARDED

Tennessee—PIPE LINE—Tennessee Natural Gas Co., 3rd Natl. Bank Bldg., Nashville, 26 mi. pipe line Cheatham and Davidson Counties to Saigh Const. Co., c/o owner. **$800,000.** Awarded 8/21. CD 4/26/46.

▲ **Wash., Seattle**—TRANSFORMERS—City, County-City Bldg., Seattle, Zone 4, 6 transformers for City Light sub-station at Bothell, to General Electric Co., 1 River Rd., Schenectady, N. Y. **$1,098,000.** Est. $1,200,000. Bids 8/25, awarded 8/31. CD 9/5, under LB.

▲ **Wyoming, Nebraska, Kansas and Illinois**—OIL PIPE LINE—The Platte Pipe Line Co., Casper, Wyo. (British-American Oil Co., Ltd., Continental Oil Co., Ohio Oil Co., Pure Oil Co. and Sinclair Refining Co.) crude oil pipe line will consist of 140 mi. 16-in. pipe from Worland to Casper Wyo., and 940 mi. of 20-in. pipe from Casper to the Wood River area, routed that practically all pipelines in Wyoming can be connected to it and also so it will cross and can be connected with nearly all major pipeline systems in Middle West, from Wyoming the line will extend in a southeasterly direction through Nebraska, passing, within a few miles of newly-discovered fields in Sidney area across the northeastern corner of Kansas, where it will make a juncture with present Sinclair lines at a point northeast of Carrollton, Mo. at Wood River it will connect with the trunk pipeline sys. of Ohio Oil Co. extending from Wood River to Ohio-Pennsylvania State line, total of 1,080 mi. Owner builds, **$60,000,000.**

Proposal Advertisements see pp. 110 to 112

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OFFICIAL PROPOSAL

Bids: September 20, 1950 (960)

State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Highway & Building Law, and special provisions for projects financed with federal aid funds, sealed proposals will be received until ten-thirty o'clock A.M., advanced standard time, which is nine-thirty o'clock A.M., eastern standard time on September 20, 1950 by Henry A. Cohen, Director, Bureau of Contracts & Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects: Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts & Accounts, Albany, N. Y., and at the office of the District Engineers noted below, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for plans and proposal forms for each contract is indicated below. A refund will be made in full to bidders for the return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 5 C. R. Waters, District Engineer, 65 Court Street, Buffalo, N. Y.						
Erie	FAC NT50-1	City of Buffalo: Niagara Thruway Incl. Court St. & Porter Ave. Connections) Proj. U865(5	1.059"	Cem. Conc. Pvt. 20'-37' Wide=0.86 mi. Asph. Conc. Type 2A=0.17 mi. Misc. Work=0.02 mi.	$25,000 Plans $10.00	$473,000
Erie	GISP50-1	Grand Island State Parkway, G. I. S. P. 49-1	4.81	Waterproofing Pvt. & Curb.	$100 Plans $2.00	2,000
DISTRICT No. 6 H. F. Brumm, District Engineer, 30 West Main Street, Hornell, N. Y.						
Steuben	FASS 50-9	Addison Village: South Street, Co. Rd. 5 Proj. S332(1)	0.11	Asph. Conc. Ty. 1a, Opt. 3 Sp. Alpha I-Beam 243' Alpha=$241.50	$12,000 Plans $15.00	206,000
DISTRICT No. 8 J. S. Bixby, District Engineer, Pleasant Valley Rd., Poughkeepsie, N. Y.						
Ulster and Sullivan	SH50-10P	Woodbourne-Ellenville, Pt. 2B, S. H. 49-4; Pt. 2A, S. H. 49-6; Pt. 1, S. H. 49-7 & Pt2C & Pt. 1A	11.05	8" Cem. Conc. Pavt. 24' Wide=11.02 mi. Asph. Conc. Type 1A. Opt.=0.03 mi.	$62,000 Plans $25.00	1,036,000
DISTRICT No. 10 J. J. Darcy, Dist. Engr., Montauk Hwy. at Little E. Neck Rd., Babylon, L. I., N. Y.						
Nassau		East Atlantic Beach		Beach Protection 2 Stone Jetties	5% of Bid Plans $10.00	253,500
Suffolk	RC50-35	Amityville Village: Broadway, SH1633 Amityville Village, SH 5300	0.68	Asph. Conc. Type 1A, Opt.=0.47 mi Misc. Work=0.21 mi.	$7,000 Plans $10.00	128,000
Suffolk	Cap. S.P. 50-2	Captree State Parkway Contract # 1 2.43 miles		Grading Drainage & Misc. Work	$22,000 Plans $15.00	$374,000

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of "State of New York, Commissioner of Taxation & Fnance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Building Law, as set forth in "Instructions to Bidders". When optional types are permitted on contracts with federal funds, bidders must state in the space provided in the proposal the exact designation of the optional type upon which the proposal is predicated.

The right is reserved to reject any or all bids.

B. D. TALLAMY
Supt. of Public Works

Bids: Sept. 28, 1950 (972)

THE PORT OF NEW YORK AUTHORITY
CONTRACT O & M 107

Installation of Boiler Plant For Heating Building

Sealed proposals for the installation of boiler plant for heating Building No. 109, Port Newark, N. J., will be received at the office of the Director of Purchase of The Port of New York Authority, Room 1402, 111 8th Ave., New York 11, N. Y. until 11 A.M., Thursday, Sept. 28, 1950, at which time and place said proposals will be publicly opened and read.

Contract documents may be obtained upon request at the office of the Director of Purchase.

THE PORT OF NEW YORK AUTHORITY
HOWARD S. CULLMAN, Chairman
New York, September 7, 1950.

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OFFICIAL PROPOSALS

Bids: September 25, 1950 (963)

Sewage Treatment Plant

CITY OF LONG BEACH, N. Y.

1. Sealed Proposals for the construction of the herein described Contracts for a Sewage Treatment Project in the City of Long Beach, New York, will be received by the City Council until 2:30 o'clock, P.M., E.S.T., Sept. 25, 1950, in the Council Chambers, City Hall, Long Beach, New York, and there publicly opened and read immediately thereafter.

2. The work will consist of providing all labor, materials, equipment and incidentals required for the construction of the following:

CONTRACT I—GENERAL CONSTRUCTION; SEWAGE TREATMENT PLANT—FIRST STAGE: (Pumping Station, Grit Tank, Settling Tanks, Digesters, Chlorination Facilities, and Buildings. Includes approximately 19,000 cu. yds. excavation; 3,200 cu. yds. Concrete; 92 tons, C.I. pipe; 80,000 cu. ft. of building superstructure; also all equipment.)

CONTRACT II—HEATING AND VENTILATING WORK required for Sewage Treatment Plant—First Stage.

CONTRACT III — PLUMBING WORK required for Sewage Treatment Plant—First Stage.

CONTRACT IV—ELECTRICAL WORK required for Sewage Treatment Plant—First Stage.

3. Plans, Specifications, bidding and contract documents may be examined at the Office of the Consulting Engineers, Alexander Potter Associates, 50 Church Street, New York 7, N. Y., and at the Office of the City Engineer at City Hall, Long Beach, N. Y. and obtained from the latter upon the following deposits per set:—

CONTRACT I—Sewage Treatment Plant—First Stage General Construction $40.00
CONTRACT II—Heating and Ventilating work.... $15.00
CONTRACT III—Plumbing Work. $15.00
CONTRACT IV—Electrical Work. $20.00

Full refund will be made to actual bidders for return of one (1) set, in good condition, within two weeks after closing date for receipt of bids; refund for return of all other sets, in good condition, within the same period, will be fifty percent (50%) of the deposit.

4. All proposals must be on the form contained in the specifications as furnished by the City.

5. All bids must be accompanied by a Certified Check or Acceptable Bidder's Bond in the amount of Ten (10) percent of the amount of the Bid, made payable to the City Treasurer, City of Long Beach. Said checks will be returned to all, except the three (3) lowest bidders, not later than ten (10) days after opening of bids.

6. The successful bidder in each of the several contracts will be required to furnish a Performance Bond conditioned upon the faithful performance of the contract and upon the payment of all persons supplying labor and furnishing materials on the construction of the work.

7. No bidder may withdraw his bid within thirty (30) days after closing date for receipt of bids.

8. The City Council reserves the right to reject any or all bids and to waive any informality in the Bid, and to accept that proposal which in its judgment best serves the interests of the City.

CITY OF LONG BEACH, N. Y.
By: Maurice J. Fleischman
City Manager

Dated: August 29, 1950.

U. S. Government

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. 3165) will be received by Bureau of Reclamation, Bismarck, North Dakota, October 3, 1950, and then publicly opened for furnishing labor and materials and performing all work for the construction of Bismarck and Washburn substations. The work is situated 1 mile east of Bismarck, North Dakota, and 1 mile north of Washburn, North Dakota. Principal items are approximately: excavation, 9,600 cu. yds.; erecting 460,000 lbs. structural steel; furnish and erecting 46,000 lbs. structural steel; furnish and install 29,000 lbs. pipes, valves, and fittings; and other work. Time allowed for completion will be 400 days. The work is divided into 2 schedules. For particulars, address Bureau of Reclamation, Bismarck, North Dakota; or Building 1-A, Denver Federal Center, Denver, Colorado.

MICHAEL W. STRAUS, Commissioner.
(968)

(Continued on page 111)

OFFICIAL PROPOSALS

(Continued from page 110)

Bids: September 20, 1950 (952)

State Road Work

Sealed Bids will be received at the Department of Highways, Room 400, Central Highway Office Building, 1221 E. Broad Street, Richmond, Virginia, until 10 A.M., Tuesday, September 19th and 10 A.M., Wednesday, September 20th, 1950, for the construction of:

The Following Projects Will Be received on September 19, 1950:

Route	Project	County	Description
147	4743-03-04	City of Richmond	Overpass & Approaches Overpass R.F.&P. R.R. on Cary St. Road
161	2020-01	Chesterfield	86' Double 3' x 3' Box Culvert 0.24 Mi. S. of W. C. L. Richmond (Belt Boulevard)
337	4764-01-02	City of Norfolk	1.64 Mi. 2-33' x 7" Pl. Cem. Conc. Pave. 0.04 Mi. S. Bolling Ave.-0.06 Mi. N. Norfolk-Portsmouth Belt Line R.R.
60	2194-03-04	Warwick	0.37 Mi. Bit. Conc. Top Curb, Gutter & S. W. 2.02 Mi. W. of W. C. L. Hilton Village— 2.43 Mi. W. of W. C. L. Hilton Village
306	3183-02; 4883-01	Russell	0.62 Mi. 5' x 4" Conc. Sidewalk & Incidentals 0.10 Mi. E. of E. C. L. Lebanon— 0.52 Mi. N. of W. C. L. Lebanon
165 & 60	Schedules 52-50 & 54-50	Norfolk and Princess Anne	Bituminous Plant Mixed Materials Rt. 13-Y—Rt. 165 & Fort Story By-pass
60	2103-02-03-04	Alleghany	607'-5" Bridge over Jackson River & Approaches 3.62 Mi. E. of E. C. L. Covington— 2.79 Mi. E. of E. C. L. Covington
11	1634-02 (T.&P. 93)	Frederick	Truck Weighing Station 1.90 Mi. N. of N. C. L. Middletown
11	T.&P. 94	Botetourt	Truck Weighing Station 0.34 Mi. N. of Roanoke-Botetourt Co. Line
50	1953-02 (T.&P. 95)	Loudoun	Truck Weighing Station 5.60 Mi. E. of E. C. L. Middleburg
623	1318-02	Charles City	Widening Bridge over Tomahund Creek 1 Mi. from Rustic
636; 638; 689	1388-01-05-04	Spotsylvania	4.30 Mi. Bit. Surf. Treat. Int. Rt. 1 (Near Four Mile Fork)— Int. Rt. 51
675	1370-01	Patrick	4.92 Mi. 14' x 6" Stab. Base S. T. Int. Rt. 773 at Ararat— Int. Rt. 677
638; 642	1376-05	Pr. William	3.40 Mi. 16' x 6" Stab. Base, S. T. Int. Rt. 1— Int. Rt. 640 (Bethel)
743	1338-02	Grayson	3.62 Mi. 16' x 6" Stab. Base, S. T. 0.01 Mi. S. of Rt. 58— 0.004 Mi. N. of N. C. State Line
735	1358-08	Mecklenburg	1.66 Mi. 16 x 6" Stab. Base, S. T. Int. Rt. 58 (Near Buffalo Springs)— Int. Rt. 602 (White House)

The Following Projects Will Be Received on September 20, 1950.

Route	Project	County	Description
1	1658-01	Mecklenburg	8.88 Mi. Var. Pl. Conc Widening Bit. Top Virginia-N. C. Line— 0.18 Mi. N. of Int. Rt. 58
460	1906-02	Appomattox	5.84 Mi. 24' x 8" & Widening W. B. Mac. H-2 Top 0.01 Mi. W. Int. Rt. 24 at Appomattox— 1.89 Mi. E. N. & W. Underpass at Concord
46	6812-01-02; 1146-SW2	Brunswick	1.47 Mi. 5' x 4" Conc. Sidewalk & Incidentals 0.06 Mi. S. of N. C. L. Lawrenceville— 1.42 Mi. N. of N. C. L. Lawrenceville
60	2124-02	Cumberland	2.92 Mi. 22' x 6" W. B. Mac., S. T. 2.60 Mi. W. of Cumberland C. H.— 5.55 Mi. W. of Cumberland C. H.
259	5282-01-02-03	Rockingham	192'-2" Br. over Linville Creek and Approaches 0.08 Mi. E. of W. C. L. Broadway— 0.571 Mi. E. of W. C. L. Broadway
23; 78	3897-01; 3297-01-02-03-04-05-06	Wise	4 Bridges, Approaches & Incidentals (0.65 Mi.) W. C. L. Appalachia— 2.74 Mi. N. of N. C. L. Appalachia
620	1346-01-02	Isle of Wight	6.15 Mi. Bit. Surf Treatment 0.02 Mi. E. Southampton Co. Line— 2.20 Mi. W. Int. Rt. 627 (Foursquare)
601	1316-08	Caroline	1.56 Mi. 14' x 6" Stab. Base Int. Rt. 658 (Near Coffey Corner)— N. End Bridge over North Anna River
626	1362-03-04	Nelson	7.97 Mi. 14' x 6" Stab. Base, S. T. & Bridge Int. Rt. 56 (Near Midway Mills)— S. End Br. over Rockfish River Br. (Near Howardsville)
610; 647	1323-02	Culpeper	4.59 Mi. 16'-14' x 6" & 16' x 5" Stab. Base, S. T. Int. Rt. 3 (Lignum)— 0.13 Mi. E. Int. Rt. 731 (W. of Richardsville)
600	1337-02	Goochland	4.66 Mi. 16' x 6" Stab. Base, S. T. or Alts. Int. Rt. 6— Int. Rt. 643 (S. o Three Square)
679; 615	1386-01-03	Smyth	1.33 Mi. 16' x 6" & 14' x 6" Stab. Base, S. T. 0.04 Mi. S. Int. Rt. 11 (Greseclose)— 0.03 Mi. S. Int. Rt. 616
734	1353-01-03	Loudoun	7.38 Mi. 14' x 6" Stab. Base, S. T. Int. Rt. 50 (W. of Aldie)—Int. Rt. 719 (Airmont)

Plans and specifications are on file at the Richmond and Local District Office. Proposal guaranty shall be certified check or bid bond in the amount shown in schedule on back of proposal form. Bid Bond to be on form furnished by the Virginia Department of Highways. The Commission reserves the right to reject any or all bids.

U. S. Government

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. 3172) will be received by Bureau of Reclamation, Denver, Colorado, September 26, 1950, and then publicly opened for furnishing portland cement and pozzolan or portland-pozzolan cement for Cachuma Dam, Cachuma Project, California. For particulars, address Bureau of Reclamation, Building 1-A, Denver Federal Center, Denver, Colorado.

MICHAEL W. STRAUS, Commissioner.
(967)

GOVERNMENT OF THE DISTRICT OF COLUMBIA, DIRECTOR OF HIGHWAYS, D. C., September 6, 1950. SEALED PROPOSALS will be received in Room 509, District Building, 14th and 'E' Streets, N. W., Washington 4, D. C., until 2:00 p.m., EASTERN STANDARD TIME, September 27, 1950, and then publicly opened and read for constructing a bridge under the Baltimore & Ohio Railroad tracks on Kansas Avenue, N.W., Washington, D. C. The proposed underpass structure will consist of two 31 feet clear spans measured perpendicular to Kansas Avenue with a deck width of 67 feet overall. The structure will consist of steel beams encased in concrete on reinforced concrete abutments and pier. Approximate quantities of the major items of the work are 2,900 cubic yards Foundation Excavation, 6,100 cubic yards Roadway Excavation, 2,253 cubic yards Concrete, 45,200 pounds Reinforcing Steel, 380,090 pounds Structural Steel, 8,750 linear feet Cast-in-place Concrete Piles. Proposal forms, specifications, and drawings may be obtained in the Office of Chief Clerk, E. D., Room 427, District Building (Telephone National 6000, Extension 2378) upon deposit of a certified check in the amount of $10.00, payable to the order of the Collector of Taxes, District of Columbia, for each set. Not more than three (3) sets will be furnished to one bidder. Unused plans and specifications are required to be returned within ten (10) days after bid opening.
(970)

OFFICIAL PROPOSALS

Bids: (971)

Refuse Incinerating Plant

BUFFALO, NEW YORK
NOTICE TO BIDDERS

Sealed proposals invited by the City of Buffalo, New York, for the construction of Contract A—Furnaces and Appurtenances, of the Refuse Incinerating Plant, will be received by the Commissioner of Public Works at his office, 502 City Hall, Buffalo, New York, until 11:00 A.M., Eastern Standard Time, October 3, 1950, at which time they will be publicly opened and read aloud. The proposals shall be for furnishing all labor and materials, and performing all work for installing and erecting, for testing and for placing in satisfactory operation the furnaces and appurtenances required to incinerate mixed refuse. The equipment will be installed and erected at the new Refuse Incinerating Plant to be built on Squaw Island.

The Instructions to Bidders, Proposal, Agreement, Specifications, Plans, and Form of Performance Bond may be examined at the office of the Commissioner of Public Works, Buffalo, New York, and at the office of Greeley and Hansen, Engineers, 220 South State Street, Chicago 4, Illinois. Copies of these Contract Documents may be obtained upon the deposit of $25.00 for each set. Any bidder, upon returning such set promptly and in good condition, will be refunded his deposit.

No proposal will be considered unless it is accompanied by a certified check made payable to the City of Buffalo, certified by an incorporated bank or trust company in the amount of not less than five per centum of the bid, or in lieu thereof, by a bid bond on the prescribed form in the amount of not less than 25 per centum of the amount of the bid, conforming to law as provided in the Specifications.

In the case of the bidder's failure to enter into the contract for the doing of the work or improvement or to furnish the bond guaranteeing the performance of the contract, such certified check shall be and become the property of the City of Buffalo as the agreed and liquidated amount of damages to the City of Buffalo, caused by such failure; or if a bid bond was given, then the penal sum of such bid bond in the amount of 20 per centum thereof, shall be and become the minimum amount of the damages suffered by the City of Buffalo as liquidated damages caused by such failure. The checks and bid bonds of all excepting the three lowest formal bidders will be returned within three days after the opening of bids, while the remaining checks and bid bonds will be returned within 48 hours after the approval of the executed contract between the Owner and the accepted bidder, or if no contract has been so executed within 45 days after the date of opening of bids, upon demand of the bidder at any time thereafter so long as the bidder has not been notified of the acceptance of the bidder's bid. Bid bonds must be approved by the Comptroller and the Corporation Counsel of the City of Buffalo before presenting proposal

The City of Buffalo reserves the right to waive any informvalities in or to reject any or all bids and to accept the bid which is deemed most favorable to the interest of the City, after all bids have been examined and canvassed.

CITY OF BUFFALO
By FREDERICK W. CRANE
It's Commissioner of Public Works
Dated at Buffalo, New York,
September 11, 1950

U. S. Government

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. 3174) will be received by Bureau of Reclamation, Fort Sumner, New Mexico, October 3, 1950, and then publicly opened for furnishing labor and materials and performing all work for the construction of earthwork, pneumatically applied mortar lining, and structures, Station 137+65 to end, Main Canal, Fort Sumner Project, New Mexico. The work is situated near Fort Sumner, New Mexico. Principal items are approximately: 85,400 cu. yds. of excavation; 57,400 sq. yds. of pneumatically applied mortar in canal lining; 800 cu. yds. of concrete in structures; installing 33,800 lbs. of slide gates and other metalwork; and other work. Time allowed for completion will be 180 days. For particulars, address Bureau of Reclamation, Fort Sumner, New Mexico; or Building 1-A, Denver Federal Center, Denver, Colorado.

MICHAEL W. STRAUS, Commissioner.
(973)

(Continued on page 112)

OFFICIAL PROPOSALS

(Continued from preceding page)

Bids: Nov. 30, 1950 (964)

Tenders for Escalators Yonge St Subway

CONTRACT SE-1

Sealed tenders, endorsed "Tenders for Escalators for Yonge Street Subway, Contract SE-1" will be received by the Toronto Transportation Commission at its office, 35 Yonge Street, Toronto, until 12 Noon, Eastern Standard Time, on Thurday, November 30th, 1950.

The work for which such tenders are invited consists of the supply and installation of 12 escalators at specified locations on the Yonge Street Subway, as described in the Requirements for Tendering and Instructions to Tenderers.

All tenders must be made upon blank forms of tender as prepared by the Toronto Transportation Commission and included in the Contract Documents, and shall be made in accordance with the provisions contained in said documents.

The successful tenderer will be required to furnish, execute and deliver to the Commission a performance bond satisfactory to the Commission in the amount and within the time set out in the Contract Documents.

The Contract Documents including site plans and specifications, are on file and may be obtained by tenderers at the office of the Toronto Transportation Commission, 35 Yonge Street, Toronto.

Each tender must be accompanied by cash or a certified cheque on a chartered bank doing business in the City of Toronto, in the amount of Ten Thousand Dollars ($10,000.00) payable to the order of the Toronto Transportattion Commission.

The Toronto Transportation Commission reserves the right to reject any or all tenders and to disregard any informalities in the tenders or tendering.

Wm. C. McBrien, Chairman
TORONTO TRANSPORATION
COMMISSION

Bids: Sept. 27, 1950 (966)

Outlet Sewer and Plant Electrical Work

THE LINDEN ROSELLE SEWERAGE
AUTHORITY
LINDEN, N. J.

1. Sealed proposals for the construction of the herein described contracts of a pollution abatement project in the City of Linden, New Jersey, will be received by the Linden Roselle Sewerage Authority in the Council Chambers, City Hall, Linden, until 8:00 P.M. on Wednesday, September 27, 1950, and there publicly opened and read immediately thereafter.

2. The work will consist of providing all labor, materials, equipment and incidentals required for the construction of the following:

CONTRACT II—Plant Outlet Conduit & Sludge Force Main: (Approx. 3660 L.F. of concrete flume; 26,000 L.F. timber piling; 3660 L.F. 24-inch R.C. Pipe; and appurtenant structures).

CONTRACT X—Electrical Work: (For Sewage Treatment Plan)

3. Plans, specifications, bidding and contract documents may be examined at the office of the Consulting Engineers, Alexander Potter Associates, 50 Church Street, New York 7, N. Y., and there obtained upon the following deposits per set:

CONTRACT II—Plant Outlet Conduit & Force Main	$20.00
CONTRACT X—Electrical Work	$20.00

Full refund will be made to actual bidders for return of one (1) set, in good condition, within two weeks after closing date for receipt of bids; refund for return of all other sets, in good condition, within the same period, will be fifty percent (50%) of the deposit.

4. All proposals must be on the form furnished by the Authority.

5. All bids must be accompanied by a certified check or acceptable bidder's Bond in the amount of ten (10%) per cent of the amount of the bid, made payable to The Linden Roselle Sewerage Authority. Said checks or bonds will be returned to the unsuccessful bidders not later than Thirty (30) Days after opening of bids.

6. The successful bidder in each of the several contracts will be required to furnish a Performance Bond conditioned upon the faithful performance of the contract and upon the payment of all persons supplying labor and furnishing materials on the construction of the work.

7. No bidder may withdraw his bid within Thirty (30) Days after closing date for receipt of bids.

OFFICIAL PROPOSALS

8. The Authority reserves the right to reject any or all bids and to waive any informality in the bid.

BY ORDER OF THE SECRETARY OF
THE LINDEN ROSELLE SEWERAGE
AUTHORITY
CHARLES H. GROSS

DATED: September 7, 1950

Bids: Sept. 27, 1950 (969)

State of Rhode Island & Prov. Plantations Dept. of Finance Div. of Purchases

NOTICE TO ROAD AND BRIDGE CONTRACTORS

Sealed Proposals addressed to the Division of Purchases, for the construction of the following project will be received by the Division of Purchases at the office of the State Purchasing Agent, Room 123 State House, Smith Street, Providence, Rhode Island, until 10:30 A.M. (E.S.T.), on the 27th day of September 1950, at which time they will be opened and read in public.

R. I. Contract No. 5019, R. I. Federal Aid Project No. U-UG-F143(1), County of Providence, Olneyville Square, Providence, Rhode Island. Construction of the final section of Expressway from end of CONTRACT TWO at Westminster Street to Harris Avenue, including one two-span overpass, one single-span overpass, and one single-span underpass at Broadway and a two-span decked girder and beams span railroad overpass; together with paving and incidentals. Service Road No. 7, installation of signs within contract, walls, utilities, and all other appurtenant items of work.

Bids for the above work must be made on blanks furnished by the Department of Public Works, Division of Roads and Bridges. Plans and specifications and Special Provisions may be examined at Room 123 State House or Room 232 State Office Building, Providence, Rhode Island, on and after Wednesday, September 6, 1950, every week day except Saturdays and Holidays, between the hours of 8:30 A.M. and 4:30 P.M. Blanks for submitting proposals may be obtained thru the office of the State Purchasing Agent at the address above stated.

A deposit of $100.00 shall be made for each set of contract documents and $50.00 will be refunded if plans and specifications are returned in good condition prior to October 17, 1950.

A certified check or bid bond payable to the State of Rhode Island, or cash, in the amount of $60,000 must be furnished by each bidder.

This Proposal Guaranty will be returned after the Contract has been executed. A performance bond of one hundred (100) percent of the contract price with a satisfactory surety company will be required of the successful Bidder. The Division of Purchases reserves the right to reject any or all bids.

FEDERAL REQUIRED CONTRACT PROVISIONS: The attention of prospective bidders is called to the fact that this project is to be bid upon and the contract executed under the rules and regulations for carrying out the Provisions of the Federal-Aid Highway Act of 1944 and the Special Provision, dated July 2, 1948, as amended and supplemented, as required by the Department of Commerce, Bureau of Public Roads.

EMPLOYMENT LISTS: A local employment service has been designated by the R. I. Employment Service to prepare the employment lists for the project. Requests for men to be employed on this project shall be submitted to the District Office at 112 Union Street, Providence, Rhode Island.

WAGES OF LABOR: In conformity with the provision of Chapters 290 and 291, General Laws, 1938, the minimum wages for a day's work paid craftsmen, teamsters and laborers shall not be less than the customary and prevailing rate of wages for a day's work in the same trade or occupation in the locality where the work is undertaken. Such a schedule of wages has been established on a minimum hourly basis and is on file in the office of the State Department of Labor. The contractor shall pay not less than these minimum wage rates.

The attention of bidders is invited to the fact that the R. I. Department of Public Works, Division of Roads & Bridges, has been advised by the Wage and Hour Division, U. S. Department of Labor, that contractors engaged in highway construction work are required to meet the provisions of the Fair Labor Standards Act of 1938 (52 Stat. 1060).

SUBLETTING OR ASSIGNING THE CONTRACT: The attention of Bidders is directed to the Standards and/or Special

OFFICIAL PROPOSALS

Provisions covering subletting or assigning the contract.

DEPARTMENT OF FINANCE,
DIVISION OF PURCHASES
BY: Franklyn A. Adams
State Purchasing Agent

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (18)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

WANTED, SEVERAL engineering graduates under 35, by large industrial fire prevention organization for field work involving periodic inspections and special consulting service. Electrical and Chemical engineers preferred. Permanent. Openings in United States and Canada. P-7287, Engineering News-Record

CONSTRUCTION COMPANY, operating nationwide, specializing in structural concrete, such as bridge piers and their foundations and mass concrete such as dams, require A No. 1 thoroughly experienced estimator familiar with present-day costs capable of preparing comprehensive and complete estimates. To be considered, complete information must be furnished. Our organization has been advised of this advertisement. P-6974, Engineering News-Record.

WANTED: HIGH-Class Draftsmen, structural and industrial. Also, experienced structural designers in steel or reinforced concrete. Also, concrete detailers. Seelye, Stevenson & Value, 101 Park Avenue, New York, N. Y.

HELP WANTED-ESTIMATOR. Large Construction Company desires man approximately 35 years of age with Civil Engineering or Architectural Training, experienced in quantity survey work and general office expediting. Permanent position for right man. Write, stating age, experience and salary desired. P-7592, Engineering News-Record.

(Continued on the opposite page)

ESTIMATOR or COST ENGINEER

wanted for work in Brazil Age 28 to 40. By North American Company which has been building hydro-electric projects in Brazil for past 50 years. First class engineering and construction organization with good opportunities for future. Salary to suit qualifications. In reply state experience and personal status in detail. Reply to

Dept. WHK
Canadian Brazilian Services, Ltd.
Yonge & Gerrard Sts.
Toronto, Ontario, Canada

ELECTRICAL ENGINEERS

Graduates, experienced in design engineering and economic studies of steam-electric power plants and high voltage substations. Also, knowledge of power system relaying and preparation of specifications for switchboards and switchgear.

P-7541, Engineering News-Record
330 W. 42nd St., New York 18, N. Y.

ENGINEERS *Wanted*

Civil—Electrical—Mechanical—Structural

Apply KAISER ENGINEERS
Division of Kaiser Industries, Inc.
1924 Broadway Oakland, California

TIMBER STRUCTURAL DESIGNERS

Immediate positions with Los Angeles fabricator. Applicants must have up-to-date experience in trusses, framed timber and glued laminated members. Submit full experience record and photo. Confidential. Reply

P-7638, Engineering News-Record
68 Post St., San Francisco 4, Calif.

SALES ENGINEER

ENGINEERING and CONSTRUCTION

Large industrial engineering and building firm has opening in Eastern Office for qualified Sales Engineer with contacts and recent experience in selling engineering and construction services.

Submit complete information stating experience, education, personal contacts, references, date available and salary requirement. All replies will be treated confidential.

P-7642, Engineering News-Record
330 W. 42nd St., New York 18, N. Y.

WANTED

CONSTRUCTION SUPERINTENDENT

A permanent position is available in a nationally known heavy construction organization for a top-flight Construction Superintendent whose background includes large-scale concrete, dirt and rock operations. Ability to take responsible charge of field operations on bid-type projects will be necessary and past experience should demonstrate this.

Please submit complete personal information and detailed work record in your reply, which will be held confidential. Salary open.

P-7672, Engineering News-Record
330 W. 42nd St., New York 18, N. Y.

GENERAL SUPERINTENDENT

ESTIMATOR

Two men, age 30-50, presently employed who wish to improve position, wanted by contractor located in Central New York State performing heavy construction in Eastern States. Must be familiar with bridge, dam and earth work. Mail complete details.

P-7659, Engineering News-Record
330 W. 42nd St., New York 18, N. Y.

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53 W. Jackson Blvd. Chicago 4, Ill.
Room 1662 Harrison 7-4056

• SALARIED POSITIONS $3,500—$35,000

If you are considering a new connection communicate with the undersigned. We offer the original personal employment service (40 years recognized standing and reputation). The procedure, of highest ethical standards, is individualized to your personal requirements and develops overtures without initiative on your part. Your identity covered and present position protected. Send only name and address for details.

R. W. BIXBY, Inc., 272 Dun Bldg., Buffalo 2, N.Y.

POSITIONS VACANT

(Continued on the opposite page)

WANTED IMMEDIATELY—Graduate C.E. for permanent position—experienced in municipal engineering — salary range 300-350 — location in Southeast—send full details. P-7589, Engineering News-Record.

INSPECTORS OR Engineering Aids for Field and laboratory; experienced in field control of asphalt, concrete, and soils. Give age, qualifications and salary desired. Toledo Testing Laboratory, Toledo, Ohio.

MECHANICAL DRAFTSMEN: Must be experienced in power plant layout, piping, steel work, coal conveyors, and other power plant equipment, for employment in Milwaukee area. In your reply, furnish details on experience and qualifications, age, salary required, etc. Employment Office, Wisconsin Electric Power Company, 231 West Michigan Street, Milwaukee 3, Wisconsin.

ESTIMATOR FOR well established New York general contractor, operating in NYC, upstate NY and NJ—private and public building and heavy construction. Please give outline of experience, age, education, references, salary expected and when available. P-7614, Engineering News-Record.

STRUCTURAL STEEL Detail Draftsmen and Checkers. Must be experienced. All type structures. Send complete written information. Samborn Steketee and Associates, 1214 Cherry St., Toledo 2, Ohio.

ROAD ENGINEER Wanted—Registered, with construction experience, also drafting and specifications. References. Modoc County Board of Supervisors, Post Office Box 177, Alturas, California.

LARGE MIDWESTERN Nationally Operating Contractor has openings in their organization and on their projects for several First-Class foremen and superintendents on highway construction in East and West. Also opening for first-class bridge constructing foreman or superintendent. P-7641, Engineering News-Record.

STRUCTURAL DESIGNER experienced in heavy reinforced concrete structures. Steam power plant experience preferred. State age, technical training, experience and salary desired. Reply to Duke Power Company, Engineering Department, P. O. Box 2178, Charlotte, N. C.

STRUCTURAL DRAFTSMAN with at least 5 years experience on heavy concrete and steel work. State age, experience and salary desired. Reply to Duke Power Company, Engineering Department, P. O. Box 2178, Charlotte, N. C.

SUPERINTENDENT FOR Sand and Gravel Plant in the middle west. State age, education, experience, references and salary expected. P-7666, Engineering News-Record.

CHEMICAL ENGINEER for Cement plant in middle west. State age, education, experience, references and salary expected. P-7665, Engineering News-Record.

MECHANICAL ENGINEER for Cement plant in middle west. State age, education, experience, references and salary expected. P-7667, Engineering News-Record.

POSITIONS WANTED

CONTROLLER-OFFICE Manager Heavy construction contractor. Accounting, Systems, Costs, Taxes, Insurance, Payrolls, Main, subsidiary and Joint Venture accounts. 15 years complete charge. Handled 20 million dollar a year volume. College Grad. Will relocate. PW-7547, Engineering News-Record.

CONSTRUCTION SUPERINTENDENT, heavy grading projects, earthfill dams, highways, airports, flood control, incidental concrete. Thorough knowledge of equipment and maintenance. Can estimate for bidding purposes aforementioned work. Handle any size project from beginning to end. References and projects built over past 18 years furnished. PW-7596, Engineering News-Record.

SALES ENGINEER—25, B.Sc in Mech. Eng.—Free to travel anywhere—municipal construction and selling experience — prefer salary — commission basis. PW-7647, Engineering News-Record.

PRACTICING REGISTERED Architect for 13 years in Ohio wishes to assist engineering firm, doing industrial and commercial work, on design and site layout. PW-7637, Engineering News-Record.

CIVIL ENGINEER, University graduate. Certificate as P.E. of Nat. Bureau of Eng. Registration. Over 20 years of excellent experience as project manager and designer on Industrial buildings, bridges, hydro-electric developments, airports, etc., office and field. Interested in executive position here or abroad, pref. S. A., where initiative, resourcefulness and dependability are needed. Please state salary to be expected. PW 7680, Engineering News Record.

(Continued on the following page)

LEARN TO ESTIMATE

Today, more than ever before, you must know how to analyze building costs. If you want to become a successful builder, learn how to prepare a correct estimate in a hurry. Get in on the profitable work now available wherever you turn. Your success is assured if your estimates are right; otherwise you are licked before you start.

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CONSTRUCTION MANAGER AVAILABLE

Experienced general construction man seeks General Contractor requiring services of a Construction Manager for large projects or joint ventures. Foreign or domestic. Highest references.

PW-7540, Engineering News-Record
330 W. 42nd St., New York 18, N. Y.

CONSTRUCTION SUPERINTENDENT

Available on two weeks notice. Interested in foreign projects only. Have 10 years experience in Central and South America on all types of heavy Construction. Can speak, read and write, Spanish, French and Italian. Will go anywhere. Superb record and references.

PW-7669 Engineering News Record
330 W. 42 St., New York 18, N. Y.

POSITIONS WANTED
(Continued from preceding page)

MANAGEMENT ENGINEER: Analysis of financial and manufacturing company reports, supervision over special situation, highly technical operations, plant improvements and extensions, development exports-imports. PW-7639, Engineering News-Record.

GENERAL SUPERINTENDENT and Engineer 27 years experience in complete charge of dirt moving sewers, highways, tunnels, and foundations available immediately. PW-7668, Engineering News-Record

CONTRACT WORK

Civil Engineering firm
located in Western Pennsylvania has competent Registered staff and floor space available to handle sub contract design work in the heavy construction category. Inquiries invited. CW-7576, Engineering News-Record.

PATENT ATTORNEY

Patent Practice
before U. S. Patent Office. Validity and infringement investigations and opinions. Booklet and form "Evidence of Conception" forwarded upon request. Lancaster, Allwine & Rommell, Registered Patent Attorneys, Suite 454, 815-15th Street, N. W., Washington 5, D. C.

WANTED

Large engineering firm wishes to acquire several complete plants through purchase of (1) capital stock, (2) assets, (3) machinery and equipment, whole or in part. Personnel retained where possible, strictest confidence.

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Gravel Plant Capacity 1000 Yards a day not over 3 yrs. old
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$1\frac{1}{2}$ Yd. Steam Crawler Crane
Locomotives and Locomotive Cranes
Crawler and Gantry Cranes

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WANTED

Fairleads — Counter-weight — Lagging — and Boom 50' to 75' for Bucyrus-Erie 44B. State all in first letter — Price & Location

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1—Caterpillar D8 W/angledozer 1H Series
2—LaPlant 15 yd scrapers
1—Buffalo Roller, 10 ton
1—1946-D4 Traxscavator W/angledozer
1—1949 Bros wobble wheel roller
1—Cat. 12 grader
1—L. J. Mack Tractor & 40 ton Jahn Trailer
1—Barber-Greene 448 trencher

Location Central New York

FS-7661, Engineering News-Record
330 W. 42nd St., New York 18, N. Y.

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Gardner-Denver 500 cubic foot two-stage water-cooled, D13000 Caterpillar diesel on four pneumatics. Used one month.
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Gardner-Denver air-cooled 105 cubic foot with air receiver, V-belt drive from power take-off and mounted on 1942 Ford chassis with Wood two-yard dump body.
LeRoi 2-stage 105 cubic foot air-cooled, skid mounted, built-in tool boxes, hose reels and hose.
Gardner-Denver two-stage 160 cubic foot skid mounted.
Worthington 210 cubic foot, two-stage, air-cooled, on steel wheels with Hercules diesel.
Gardner-Denver 315 cubic foot two-stage, skid mounted, Murphy four-cylinder diesel.
Pennsylvania 12" x 10" class 3A single cylinder, 355 cubic foot P.D., flat belt driven 50 HP slip ring motor.
Worthington two-stage, water-cooled, vertical 250#, 60 CFM, new condition.

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Cedarapids BBB 1036 Scalper.
10 x 20 Beaumont jaw crusher.
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2½-ton GMC, New and rebuilt.
Sterling COE Model 255GCS tandem drive tractor 9.00x24 tires, 200 HP Cummins supercharged diesel, complete with 40-ton Rogers low bed equipment trailer, 16—7.50x20 tires, airbrakes, outriggers, excellent condition.
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New and rebuilt Murphy diesels.
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Lorain 75B, 1¼ yd. shovel, diesel power.

Lorain 55B gas powered crane.

P&H Model 625A 15-ton crawler crane.
Marion 25-ton diesel powered heavy duty truck crane on heavily reinforced Mack.

Brownhoist 1-yd. gas shovel and crane.

Lorain 30 combination ½ yd. shovel, hoe & clam.

P&H Model 150 ½ yd. truck crane on 6x4 Mack.

SHOVEL & CRANE ATTACHMENTS

Lorain 75B-77 1½-yd shovel attachment rebuilt.
P&H 203 shovel attachment.
Chain crowd Lorain 30A shovel attachment.
Lorain 40 Hi-Lift shovel attachment.
Bucyrus-Erie 30B tunnel front attachment.
Koehring 301 dragline fairlead.
50' crane-clam boom, 1¼ or 1½-yd.
Lorain 75 fairlead.

Backhoe Buckets & Attachments

¾-yd Lorain, 40, LBS #8105. 44" cutting width, teeth, sheave.

27" outside width drop bottom type LBS #1033, good condition.

26" outside width solid bottom type LBS #4377 good condition.

¾-yd Amsco 40" cutting width, LBS #8101.

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NEW TAGLINES

McCaffrey Model 648 for 1¼ to 2-yd crane.
McCaffrey Model 636 for ¾-yd to 1-yd crane.

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Lorain 41, ¾-yd. LBS #7433, rebuilt.
New Lima 1-yd. Amsco, LBS #2295.
Bucyrus-Erie 1¼-yd gas air, LBS #3782, fair.
Lorain 75 manganese 1¼-yd, LBS #7233, teeth and bail.
Lorain 75B, 1¼-yd extended lip, 1¾-yd LBS #2260.
Pettibone-Mulliken 2-yd Lorain 82 or 820, manganese, LBS #5361.
Pettibone-Mulliken 2-yd for 3500 Manitowac LBS #5763.

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Concrete Finishers

Jaeger type "L" double screed, 10½'-12½', rebuilt.
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830'—Truscon 7"x8" forms, with stakes.
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Cleveland formgrader, new condition.
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Hercules 9-11 ton, three-wheel.

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New Warco D76 tandem driven grader, 12' blade, V-type scarifier, 13.00x24 tires all around, 24,500 lbs., International UD14A diesel engine.

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FD Cletrac crawler tractor, Buckeye bulldozer & double drum power control unit, DHXB Hercules diesel engine. Rebuilt, immediate delivery.

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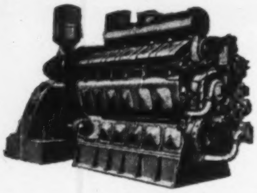

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937.5	General Motors	12-567	1080	720	312	Clark	MD-4	375	327
625	Alco	6-12½x13T	750	600	125	General Motors	3-268A	150	1200
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105 CFM INGERSOLL (Gas) 2 & 4 Pneu
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210 CFM GARDNER DENVER (Gas) 4 Pneu
210 CFM WORTHINGTON (Gas & Diesel) 4 Pneu
315 CFM LeROI (Gas) 4 Pneu
315 CFM INGERSOLL (Diesel) 4 Pneu
315 CFM WORTHINGTON (Gas & Diesel) 4 Pneu
500 CFM WORTHINGTON (Diesel) 4 Pneu

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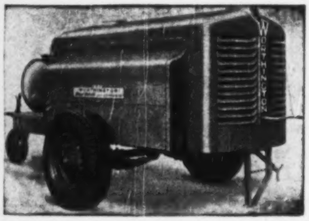

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1—45' Crane Boom for Link Belt LS90.
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1—40 Ton Orton Diesel Loco. Crane.
1—30 Ton Browning Steam Loco. Crane.

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Rittenhouse 6-2311

DRAGLINES: Monighan 165 ft. boom, 12 yd. bucket, diesel power, condition like NEW. Monighan 5-W, diesel, 120 ft. boom. Page 5 yd. diesel, 110 ft. boom.

SHOVELS: Bucyrus Erie 120-B electric, 4 yd. capacity. Marion 4161 electric, 5 yd. capacity. P & H 2-½ yd., model 955, diesel Shovel and one 955 diesel Dragline, long cats, D-17000 motor, 75 ft. boom.

LIMA 802 Shovel Attachments only, condition like NEW.

ROAD ROLLER: Buffalo-Springfield 10 ton, 3 wheel, powered by International UD9 diesel engine, with scarifier attachments, used four weeks.

GRADER: Caterpillar model 12 with scarifier and cab.

TRUCKS: Euclid model T, end dump, rock bodies, 22 ton cap., 275 H.P. Cummins motors.

LOCOMOTIVES: 30 ton, gasoline, standard gauge, 10 ton, gasoline, standard gauge.

DERRICKS: 75 ton Stiff Leg, 100 ft. boom. 100 ton Guy, 160 ft. mast, 140 ft. boom, with or without electric hoist.

DRYER or KILN: Allis Chalmers 10 ft. x 90 ft., heavy duty, located Minnesota.

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1—50 ton Porter Loco. 0-6-0 Std. gauge.

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Single drum gas hoist reversible
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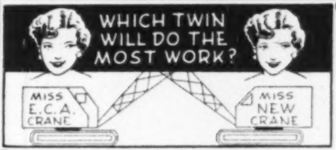
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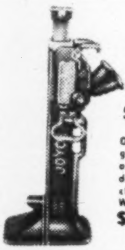

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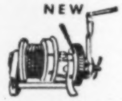

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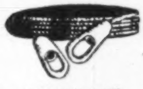

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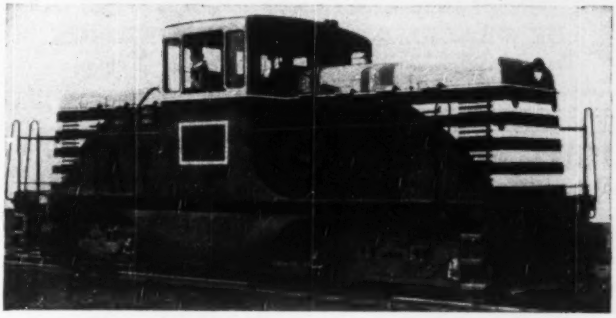

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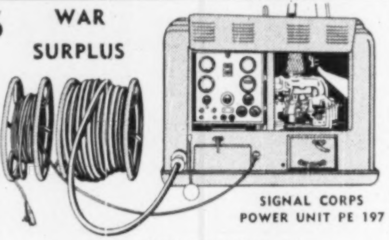

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1½ c.y. shovel
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Plates — from 3/16" to 1"

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Factory new Barnes Centrifugal Pumps
Sizes 3" to 6"
Immediate Delivery

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FOR SALE
Double Drum Skagit Gaso. Hoist, Model BU-140
Capacity 49000# @ 57 F.P.M.
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FOR SALE
Used centrifugal pump, motor & starter
Rated capacity 1,000 gals. per minute at 110 foot head, Warren Steam Pump Co., in excellent operation condition, removed for replacing with larger unit. $500 complete.

FS-7623, Engineering News-Record
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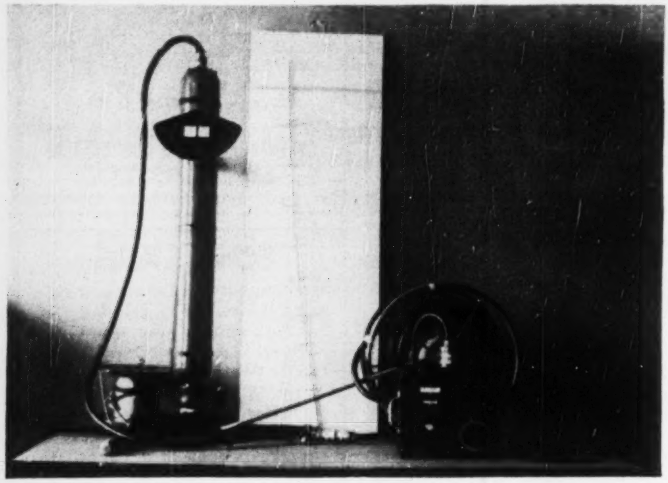
NEW PRODUCTS



Electronic Plumb Bob Indicates Vertical Deviation of Hollow Piles

Hinchman electronic device is designed to enable the engineer to accurately trace the course of hollow piling as it is being driven. Among the advantages claimed by the manufacturer are: It will permit the use of increased loadings in design by providing more accurate information as to the location and bearing of the pile, and that it will result in less rejection of out-of-plumb piles which are often discarded as soon as an electric light lowered into them passes from view due to horizontal displacement of the lower end. The apparatus consists essentially of two self-synchronizing motors set to record the vertical angle between them. The plumb bob is located in a metal capsule measuring 4 ft in length and 5 in. in diameter. As the capsule is lowered, it is deflected parallel to a chord of the bend where it meets a curved section of the pile shell. Because the plumb bob is hanging vertically, it causes an angular deviation to occur between the two motors. This angle is then read off directly. Deflections 90 deg apart are recorded at each reading, and the resultant slope computed. Plotting deflections at known points along the length of the pile thus provides a fairly accurate picture of the actual position of the pile.—The Hinchman Corp., Electronics Division, Francis Palms Bldg., Detroit, Mich.

Electric Concrete Saw

Cutter for concrete is powered by a $1\frac{1}{2}$-hp electric motor. It features a choice of either wet or dry cutting. Guide rails are designed to provide a straight, clean cut, and to eliminate cutting-blade breakage. The Creeper saw has a 14-in. maximum blade capacity. It will cut to a depth of 5 in.—Martin Fireproofing Corp., Saw Division 2200 Military Road, Buffalo 17, N. Y.

Sewer-Rodding Machine

Power machine provides economical means of mechanically performing all sewer-rodding operations. The Sewe-Roder rotates special steel rods, pushes and pulls them, and tugs back loads. It can be operated at speeds up to 100 fpm. Footage meter permits accurate recording of location of tool in the line at all times.—Flexible Sewer-Rod Equipment Co., 9059 Venice Blvd., Los Angeles 34, Calif.

Air-Operated Transfer Pump

Fast-Flo pump is designed for quick transfer of fluids and semi-fluids from original drums to other containers. The pump weighs 15 lb, and is easily handled by one man. It fits all drums with 2-in. openings. Delivery up to 18 gpm at an operating pressure of 150 lb is claimed.—Gray Co., Inc., Industrial Div., Graco Square, Minneapolis 13, Minn.

Self-Priming Pumps

Centrifugal pump features: Elimination of all valves; positive self-priming with no reservoir; no re-circulation during pump stage; and high efficiency. They are available in sizes from ¼ to 5 hp, with open and closed impellers. Specifications are listed at: 120 gpm, heads to 135 ft, and suction lifts to 25 ft.—Goulds Pumps, Inc., Seneca Falls, N. Y.

Tractor-Mounted Concrete Drill

Schramm Pneumajack consists of a pneumatic cylinder mounted on a vertical column at the rear of a Pneumatractor, with a D-55 or D-45 rock drill mounted on the piston rod of the pneumatic cylinder. Drill has a 36-in. movement, making possible 24-in. drill changes. The unit is recommended for drilling holes in pavements, for mud jacking, and other purposes. It can also be furnished with back-fill tamper, or a paving breaker. — Schramm, Inc., West Chester, Pa.

Propane Engine in New Models

Propane engines are now available in four models with capacity of 162 to 250 bhp. Compression ratio in the Fageol engines is said to permit full utilization of propane's 125 octane rating. Engines are available for horizontal or vertical mounting, right or

(Continued on page 125)

Protection here is more than "SKIN DEEP"— Tank material is BYERS WROUGHT IRON

This tank, just being lifted from the galvanizing bath, is one of three ordered by the New York Board of Water Supply for installation in a sewerage project at Grahamsville. The tanks were specified "Wrought Iron." One tank, 36-in. in diameter, will be used for oil, and two, 42-in. in diameter, for water. The general contractor on the project is Di Marco and Ciccone, Inc.; tanks were fabricated from Byers Wrought Iron plates, and galvanized by L. O. Koven and Brother, Inc.

When the design calls for galvanizing, wrought iron offers a definite advantage, for the naturally rougher surface of the material takes and retains a heavier coating. Of even greater importance is the fact that corrosion resistance is not confined to this surface coating, but is inherent in the wrought iron itself. A break in the galvanizing does not mean the *end* of protection, but the real *beginning!*

Some of the most dramatic examples of wrought iron's unusual durability are provided by old water towers and tanks. One such was a water tank erected by a Western railroad in 1881. Although exposed to salt air from the bay, only 200-feet distant, it continued in service for over 62 years, before it was dismantled.

Wrought iron resists corrosion in tank service because of its unique composition. Tiny fibers of glass-like silicate slag, threaded through the body of high-purity iron, halt and disperse corrosive attack, and thus discourage pitting. The fibers also anchor the initial protective scale, that shields the underlying metal.

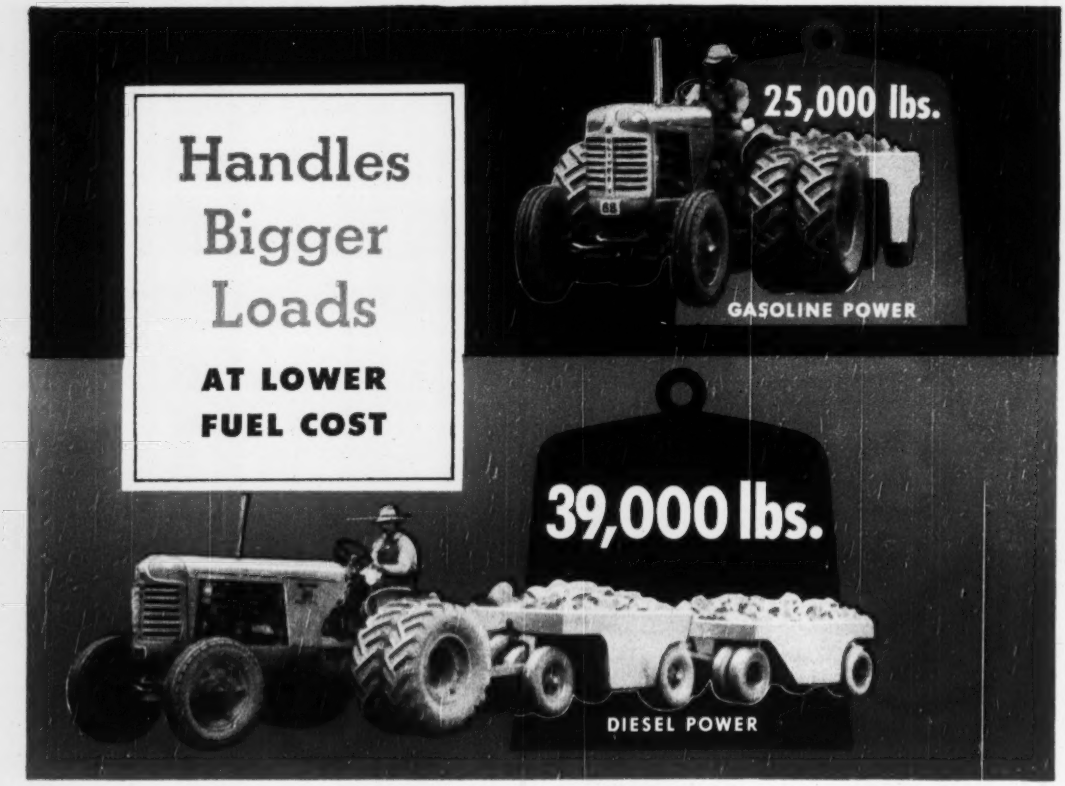
If you have any tanks that are exposed to internal corrosion from their contents, or from soil or atmosphere externally, you will find it profitable to investigate the service possibilities of Byers Wrought Iron. Write us, or ask the nearest division office for information on WROUGHT IRON FOR TANK CONSTRUCTION.

A. M. Byers Company, Pittsburgh, Pa. Established 1864. Boston, New York, Philadelphia, Washington, Atlanta, Chicago, St. Louis, Houston, Salt Lake City, San Francisco. Export Division: New York, N. Y.

CORROSION COSTS YOU MORE THAN WROUGHT IRON

BYERS
GENUINE WROUGHT IRON
TUBULAR AND HOT ROLLED PRODUCTS
ELECTRIC FURNACE QUALITY ALLOY AND STAINLESS STEEL PRODUCTS

OLIVER DIESEL POWER

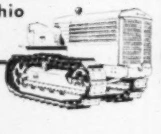


What better proof could you ask of the *economy* you get with the new Oliver "88" Diesel Wheel Tractor? On this job an "88" Diesel is handling *two* rubber-tired compaction rollers vs. a gasoline powered tractor of equivalent size pulling *one* roller. The owner reports a fuel cost saving of 50% even though the Diesel model was pulling a load of 39,000 lbs. vs. the Gasoline model pulling a load of 25,000 lbs.

The new Oliver "88" is a natural for industrial wheel tractor operations. It's remarkably easy to start . . . requires no starting preparations. Overall efficiency is high due to superior air and fuel mixture. Efficient burning of fuel and air assures exceptional fuel savings. Prolonged piston head pressure increases lugging ability under heavy loads.

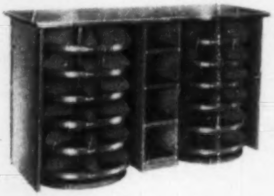
You'll find it will pay dividends in increased load handling ability . . . lower operating costs to investigate the new Oliver "88" Diesel Industrial Wheel Tractor. Your Oliver Industrial Distributor will give you the complete story.

THE OLIVER CORPORATION
Industrial Division: 19300 Euclid Avenue, Cleveland 17, Ohio
A complete line of Industrial Wheel and Crawler Tractors



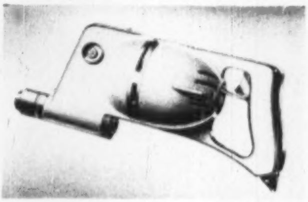
THE OLIVER CORPORATION

left-hand installation, clockwise or counter-clockwise rotation. Advantages claimed for propane engines are: Propane is odorless and colorless, engine efficiency is higher, maintenance costs are lower, and ping and spark knock are eliminated.—FAGEOL PRODUCTS CO., KENT, OHIO.



Rotary Storage Space

Rotabin counter contains 72 compartments in twelve 28-in.-dia independently rotating trays. In addition, four stationary spaces are available for large items. Over-all dimensions are 6 ft 3¼ in.x27 in.x41⅝ in.—THE FRICK-GALLAGHER MFG. CO., 250 S. BROAD ST., PHILADELPHIA 2, PA.



Lightweight Electric Hammer

Motion-conversion principle employed in the Super-Slugger electric hammer is said to result in almost vibrationless operation. Uses for this 7½-lb tool include: Channeling in concrete, drilling in concrete or masonry, toothing out mortar for pointing, and vibrating concrete forms. Easily held in one hand, it star-drills masonry at a speed of 1 in./min.; cuts auto-gage steel at a rate of 6 in./sec.—NOBLE & STANTON, 1049 S. BROADWAY, BEDFORD, OHIO.

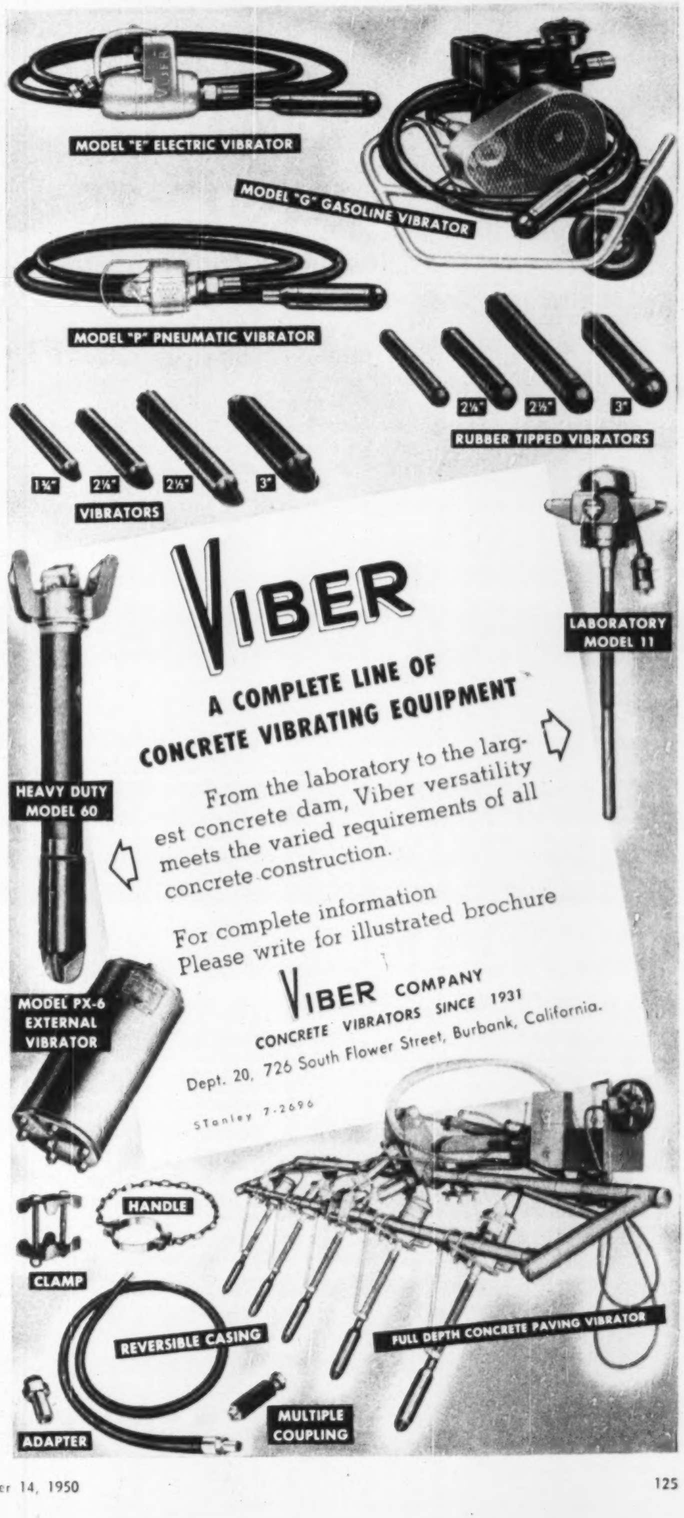
Top-Mounted Power Take-Off

Direct-connected to vehicle engine, the Tangen top-mounted power take-off eliminates the need of a conventional V-belt drive. Speed is governed by crankshaft speed without relation to transmission range. It operates at full efficiency whether vehicle is in motion or stationary. These take-offs are available to fit most makes of trucks.—MOBILE POWER, INC., BOX 997, LANSING, MICH.

Chain for Shovels, Draglines

Tensile strength of chain for power shovels and dragline use is listed at 150,000 psi. Made of Fibraloy steel.

(Continued on next page)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MODEL "G" GASOLINE VIBRATOR
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2½"
3"
RUBBER TIPPED VIBRATORS
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2½"
3"
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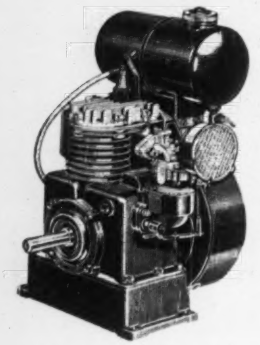

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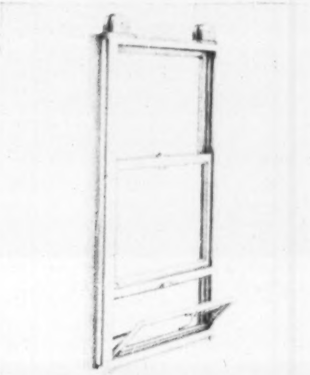
the Baer chain is said to allow longer wear within its working capacity, and to permit use of 10% lighter sections when new. Fibraloy is said to: Resist plastic deformation; not to thin out when over-loaded; and to have high shock and abrasion resistance.—BAER STEEL PRODUCTS, INC., AUBURN, WASH.



Double-Hung Aluminum Window

Built-in hopper vent is feature of the Sterling double-hung aluminum windows. The in-swinging vent is an integral part of the frame, so there is no loss of controlled ventilation at seating level. The vent may be installed above or below the double-hung window.—STERLING WINDOWS, INC., 369 LEXINGTON AVE., NEW YORK 17, N. Y.

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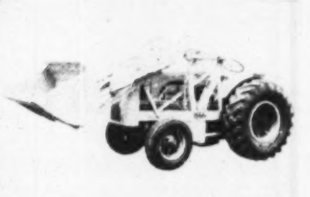
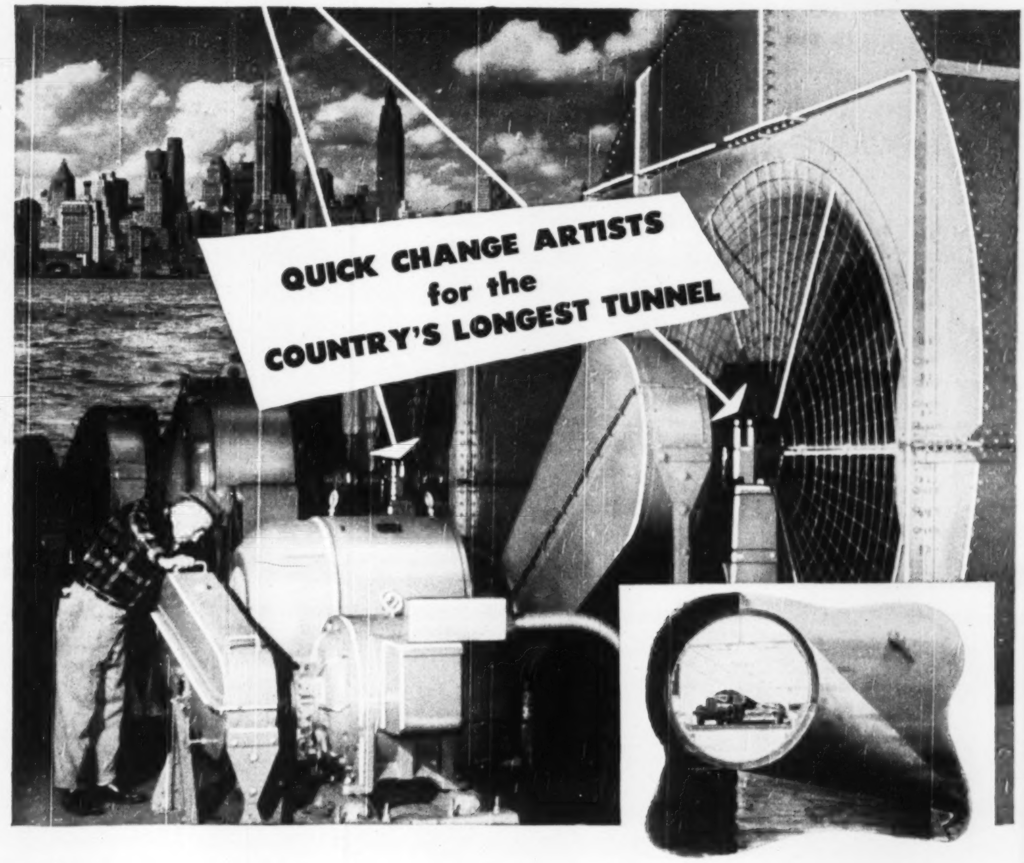
Tool for cutting dadoes is instantly adjustable from $\frac{1}{4}$ to $\frac{13}{16}$-in. in width and up to $\frac{3}{4}$-in. in depth. The Quick-Set Dado is set for any desired groove width by turning a dial, without removal from the arbor. It has eight cutters of high-speed tool steel, and is adaptable for right or left shaft rotation. — CONSOLIDATED MACHINERY & SUPPLY CO., 2031 S. SANTA FE AVE., LOS ANGELES, CALIF.



Re-Designed Shoveloaders

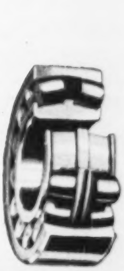
Several improvements are claimed for the re-designed Lull Shoveloaders. Among these are: Hydraulic supply tank forms upper part of radiator shield, placing it directly above the hydraulic pump, thus improving oper-

(*Continued on page 129*)



Dangerous exhaust gases don't stand a chance in the great new Brooklyn-Battery tunnel. Huge SKF-equipped ventilation fans—53 of them—provide a complete change of air 42 times every hour. Driven by 106 motors that also spin on SKF bearings, these fans—built by Westinghouse Electric Corp., Sturtevant Division—can force 11,100,000 cubic feet of air into the tunnel *every minute.*

SKF Spherical Roller Bearings were the logical choice for this ventilation system because they offer high-standard dependability. They have been specified for most of the major tunnel-fan installations. These bearings, with their inherent rolling self-alignment and extra-long life, give service that's continuous and trouble-free. Once again, SKF has demonstrated the ability to put the right bearing in the right place. **SKF** INDUSTRIES, INC., PHILADELPHIA 32, PA., *—the Pioneers of the Deep Groove Ball Bearing, Spherical Roller Bearing, Self-Aligning Ball Bearing.* 7142



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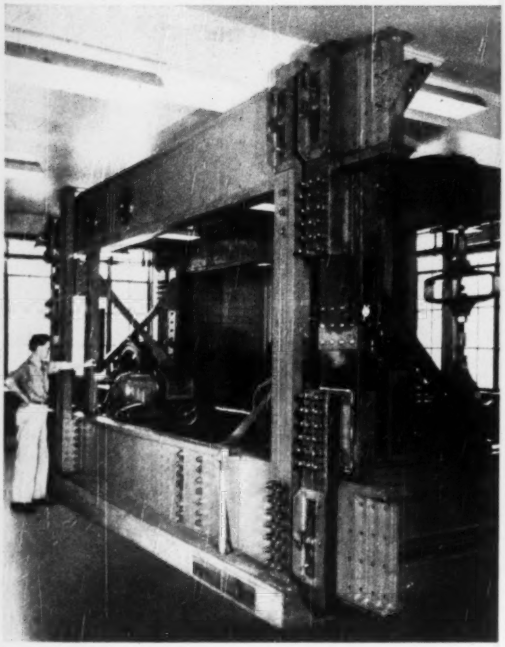

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Superior fatigue strengths and smaller slippages are obtained in structural joints fastened with high-carbon bolts . . . according to the fatigue tests shown above.

These tests have been conducted by the Northwestern Technological Institute under the auspices of the Industrial Fasteners Institute.

The results of tests such as these indicate the advantages of using bolts in structural connections. To keep up-to-date with this important trend in construction, write RB&W for a copy of the report entitled, "The Effect of Various Fasteners on the Fatigue Strength of a Structural Joint".

Jack Allan is checking the atmosphere in one of RB&W's modern heat-treating furnaces. It is a process which insures the greatest control of strength and toughness for fastening jobs where high stresses will be encountered.

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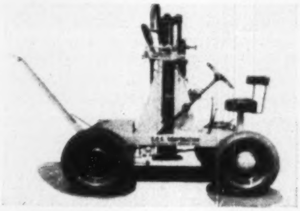
ating visibility; removable ventilating section permits easy servicing of front-end parts; larger-capacity hydraulic pumps provide faster raising, lowering, and dumping; buckets have longer lower lip to dig easier, faster, and to fill more completely; and a larger variety of bucket sizes is available.—LULL MFG. CO., 3612 E. 44th ST., MINNEAPOLIS 6, MINN.



Pavement Breaker

Model B breaker features automatic controls, said to eliminate upsurge of piston against the top head, and most of the over-reach on the bottom head. This Mighty Midget is equipped with a 200-lb head and conventional automobile rear end.—R.B.P. CORP., 2751 E. 11TH ST., LOS ANGELES 23, CALIF.

New Product Briefs

Fuel pump for diesel engines is 65% lighter and 56% smaller in size than previous models used. Manufactured by: Cummins Engine Co., Inc., Columbus, Ind.

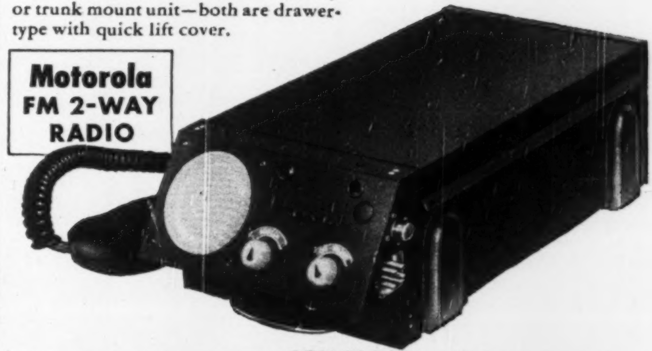
Metal partswashers range in capacity from a 5-gal unit to a 75-gal unit that can accommodate an engine block. Feature of the King unit is violent agitation of solvent set up by an impeller. Manufactured by: The Electric Heat Control Co., Cleveland 5, Ohio.

Rubber-base underlayment is said to provide fast installation and durable floors. La-Jax (Ajax Floor Products Corp., New York 19, N. Y.) contains no asphalt.

All-purpose electrode cuts, pierces, gouges, chamfers, or removes welds without oxygen or special equipment. Feature is heat-resistant coating that concentrates arc at the tip. Maker: All-State Welding Alloys Co., Inc., White Plains, N. Y.

Cleaning solution for safety goggles, respirators, and helmets combines the properties of a germicide and detergent. The No. 101 solution is available in 2-oz. bottles or gallon containers. Available from: American Optical Co., Southbridge, Mass.

Choice of new all-in-one front model, or trunk mount unit—both are drawer-type with quick lift cover.



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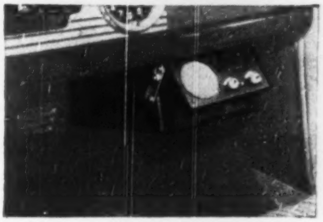
New UNI-CHANNEL SENSICON DISPATCHER—
with the marvelous Sensicon circuit...

Now the best in 2-way radio—in the Utilities and General Industry—Uni-Channel is hitting a new high in performance and a new low in maintenance costs. It will do everything that's being claimed to reduce your time and costs in material and crew handling. Motorola engineered, with eight exclusive features, it guarantees you *permanent* selectivity and reliability—minimum adjacent channel interference and maximum long-term protection against obsolescence and loss of investment. REMEMBER! When you add 2-way radio—you're ahead. When you make it MOTOROLA, you stay ahead!



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3-A

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Manufacturers' Publications

Hydraulic Jacks—Complete line of hydraulic jacking equipment in capacities from 50 to 600 tons is described in 12-p catalog 317. Items listed in the catalog include hand-operated jacking units, power-operated hydraulic jacking units, power-driven pumps, shields for shield tunneling, hydraulic circuit and controls, single-acting spring-return jacking cylinders, double-acting jacking cylinders, and special Rodgers accessories. — RODGERS HYDRAULIC, INC., ST. LOUIS PARK, MINNEAPOLIS 16 MINN.

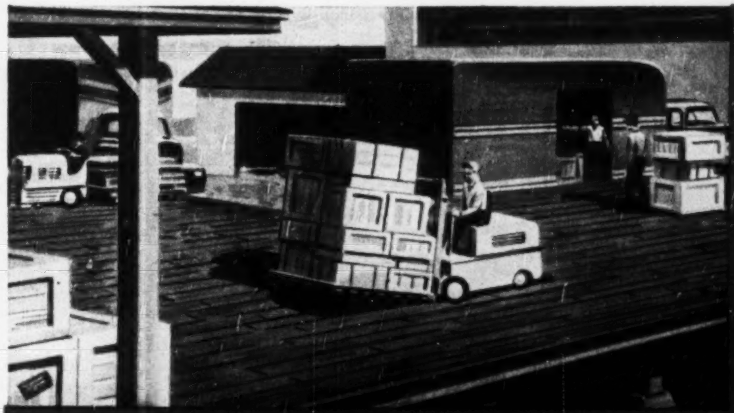
Crushing Rolls—Bulletin (40 pp) describes complete line of Traylor crushing rolls. Exploded views of each of three different types of rolls illustrate the features claimed for them. One section of Bulletin 5637 illustrates how to determine proper size roll required to do a given job with the greatest economy and efficiency. — TRAYLOR ENGINEERING & MFG. CO., ALLENTOWN, PA.

Safety Goggles Selector—Choosing of proper safety goggles for 69 specific jobs is speeded with compact easy-to-use safety eyewear selector. Job classification numbers refer users to a sliding selection table that lists such occupations as acetylene welders, drillers, platers, riveters, and the like. Frames applicable for each task are numbered and illustrated for identification.—BAUSCH & LOMB OPTICAL CO., 635 ST. PAUL ST., ROCHESTER 2, N. Y.

Solders and Soldering—Circular describes types of solders and soldering procedure. Instructions are listed for proper use of three classes of solders, and for the selection of fluxes. Illustrations of different types of soldered joints are shown, and types of soldering equipment are described and illustrated, Circular 492 (12 pp) is available at a cost of 15¢.—SUPERINTENDENT OF DOCUMENTS, U. S. GOVERNMENT PRINTING OFFICE, WASHINGTON 25, D. C.

Permalite Plaster—Fireproofing with lightweight Permalite plaster is described in two folders. One of the folders discusses fireproofing steel columns and gives necessary specifications for getting ratings of 1, 2, 3, or 4 hr. The other folder is about a suspended ceiling under non-combustible construction with a 4-hr fire rating

(*Continued on page 133*)



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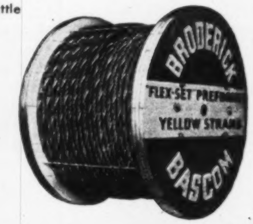

A special feature is an actual detailed drawing and short-form specification which can be copied verbatim as a part of a job specification.—GREAT LAKES CARBON CORP., BUILDING PRODUCTS DIV., 18 E. 48TH ST., NEW YORK 17, N. Y.

Engineering Instruments—Gurley line of equipment is described in revised edition of Catalog 50. Items listed include transits, engineers levels, alidades, and other instruments. This 66-p catalog illustrates manufacture of Gurley instruments; lists features of the instruments; and contains specifications for each unit in the line.—W. & L. E. GURLEY, TROY, OHIO.

Fluorescent Lighting – Booklet lists helpful information on lighting. It has a two-fold purpose: To serve as a buyer's guide; and to outline a new-type fluorescent-lighting system.—THE EDWIN F. GUTH CO., 2615 WASHINGTON AVE., ST. LOUIS 3, MO.

Water-Supply Service – Engineering services for water procurement, treatment, usage, and disposal are described in two new booklets. Various kinds of water problems—and their solutions—are described in the booklets. Illustrations show flow schemes. —HALL LABORATORIES, INC., HAGAN BLDG., PITTSBURGH 30, PA.

Heaters and Thawers—Catalog 456 describes the Hauck venturi high-pressure steam or air-atomizing oil burner for paving, rock-product plants, and similar uses. Another Hauck catalog, No. 1040, describes thawing pits for thawing frozen railroad cars of crushed stone, cinders, and other materials. It features a description of the radiant-heat principle that permits rapid thawing without direct flame contact on the car. — HAUCK MFG. CO., 124 TENTH ST., BROOKLYN 15, N. Y.

Photographic Reproductions—Sixteen page booklet describes photographic materials and methods for improving legibility of reproduced engineering drawings and business documents. Specialized recommendations describe suggested procedures for restoring old drawings and eliminating hand tracing. Microfile equipment is described briefly.—EASTMAN KODAK CO., INDUSTRIAL DIV., ROCHESTER 4, N. Y.

Tractor-Loader—Features of operation of Eimco's 104 RockerShovel are illustrated and described in a 4-p catalog. This bulletin shows how the 104 can be used for bulldozing, carrying, or loading; describes the loading control; and contains a list of specifica-

(Continued on next page)

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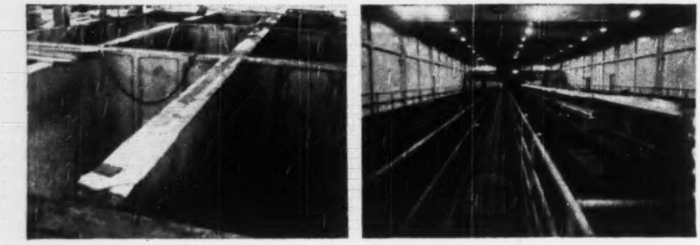

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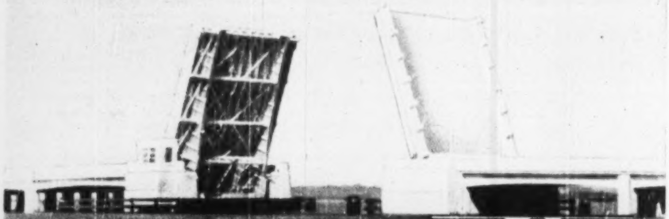

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tions. Several photographs are used to illustrate various applications of the RockerShovel.—THE EIMCO CORP., 634 S. 4TH WEST ST., SALT LAKE CITY 8, UTAH.

Concrete Buckets – Dimensions and specifications for concrete buckets ranging in capacity from ¼ to 8 yd are listed in a 4-p folder. Features listed include the double clamshell gate design, self-closing spring operated gates, discharge by remote control, and center discharge for accurate placing. The 2-compartment 8-yd Gar-Bro bucket is shown in action.—GAR-BRO MFG. CO., DIV. OF GARLINGHOUSE BROS., 2416 E. 16TH ST., LOS ANGELES, CALIF.

Drill Presses–Economy model 14-in. bench and floor-type drill presses are described in 4-p folder. Complete specifications are listed, as are prices and dealers. Attachments and accessories are illustrated, described, and priced.—SOUTH BEND LATHE WORKS, 425 E. MADISON ST., SOUTH BEND 22, IND.

Tubing Catalog – Information contained in Catalog 50 (60 pp) covers bending, warehousing and fabrication of pipe and tubing. The catalog discusses the theory of bending, the problems involved, and the equipment available to simplify the handling and use of tubing. The catalog is replete with technical data and figures. —WALLACE SUPPLIES MFG. CO., 1300 DIVERSEY PARKWAY, CHICAGO 14, ILL.

Hose and Fittings–Three-pocket portfolio contains catalogs covering a line of hose, hose ends, and tube fittings. Catalog H-1451 lists Weatherhead's reusable hose ends and hose for all hydraulic purposes, for fuel and oil lines for diesel engines, and for other flexible-hose requirements. Catalog E-1457 covers Ermeto steel and stainless steel fittings which require no flaring, threading, welding, or soldering. Catalog F-1456 shows a complete line of brass Inverted, SAE, compression, threaded-sleeve-type and pipe fittings. — THE WEATHERHEAD CO., 300 E. 131ST ST., CLEVELAND 8, OHIO.

Prestressed Concrete Pipe–Features of prestressed-concrete steel-cylinder pipe are listed in a 4-p folder. The bulletin illustrates the steps in manufacture of this type of pipe, and explains—by text and diagrams—how prestressing works as internal pressure is increased. The bulletin also lists several advantages claimed for this type of construction.—PRICE BROS. CO., 1932 E. MONUMENT AVE., DAYTON 1, OHIO

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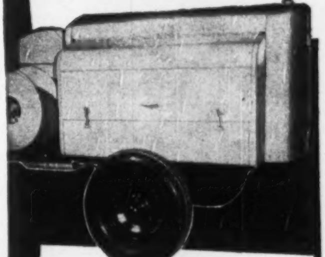

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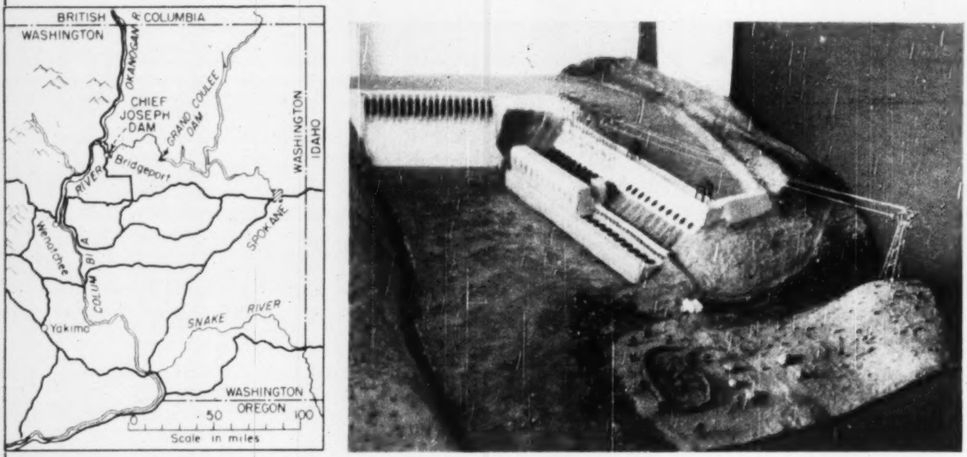
Letter from CHIEF JOSEPH



WHERE CHIEF JOSEPH DAM IS . . . and what it will look like in five years if war doesn't interfere.

This letter isn't from the real Chief Joseph, because that famous Nez Percé Indian has now been dead for 46 years. Instead it's from the site of a dam bearing his name and a project destined to be one of the greatest in the United States during the next decade—unless the Korean war upsets the timetable. There has already been speculation on that point fostered by the President's order for cutbacks in public works construction. Chief Joseph work has just started, and so could not meet the criterion of being completed in the 1951 working season. On the other hand it involves power—lots of it and in a critical area—which could afford it high priority.

And the Seattle District is going ahead with bidding on second-stage work (ENR Sept. 7, p. 26).

Located in the state of Washington on the Columbia River just below Grand Coulee Dam, the Chief Joseph project involves a power generating installation (1,280,000 kw for presently authorized 20 units) second in size only to that at Grand Coulee. On the pre-Korean schedule, first power is due in 1956, after a five year-expenditure of $220,000,000.

• Overflow-type dam—The dam will be a straight-gravity, overflow, concrete structure, 220-ft high and 1,500-ft long. Spillway capacity is 1,250,000 cfs. The powerhouse will be constructed on the left bank at an angle to the dam axis and will contain 20 generators of 64,000-kw capacity each.

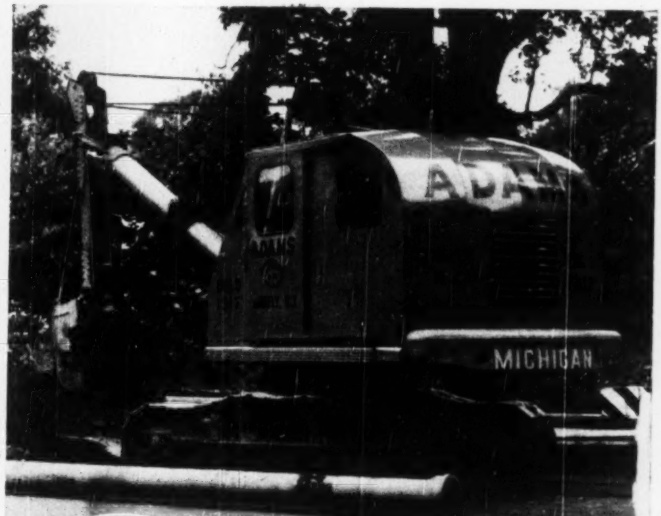
Two elements of the design are of particular interest. One is an earth-fill blanket that will cover the steep right bank of the river just upstream from the dam proper. This is intended to keep water out of a gravel formation that could not be sealed off any other way. The other feature relates to the design of the spillway bucket—special efforts being made to prevent deterioration of the types occurring at Grand Coulee and Bonneville. Extensive model tests were made at the Bonneville laboratory in the bucket design investigation. Whether or not the final design is successful can be established only after completion of the project.

Construction now under way besides necessary access roads, bridges, and improvements in the nearby village of Bridgeport, includes two $2,500,000 excavation and fill contracts—one on each side of the river. Both of these jobs are scheduled for completion early next year before the late spring floods. These contracts will, without a doubt, be completed.

• New Housing Policy—The methods of establishing housing facilities for government employees during the construction period at Chief Joseph represents a departure from earlier jobs. Instead of building an entirely new government town, the Corps of Engineers is making improvements in the existing village. These improvements will be of long range benefit. Briefly, they include 40 permanent homes, a sewerage and sewage disposal system, and additional water supply.

• Why the Name?—The Indian for whom the dam is named was known for his leadership both during the war and peace. In 1877 after a disagreement over Indian lands taken by the United States, he led a major portion of the Nez Percé tribe on a flight to Canada. This developed into the Nez Percé War. Five months later, after evasive tactics that rank Chief Joseph as a top military strategist, he and his followers were captured—but it took all the federal military cunning and strength available at the time to do it.

This Indian group later was settled on the Colville reservation that has as its southern boundary the Columbia River from below the Chief Joseph Dam site to well above Grand Coulee Dam. Chief Joseph continued as tribal leader until his death in 1904. His name and memory will be perpetuated by the dam, about whose continuing construction status there should be more news soon.



"TICKLISH JOB"

for hoe and crane operators

Close quarters, low hanging trees, pipes criss-crossing trench path . . . that made trenching a ticklish job for the hoe operator. And the crane operator's job was just as critical. Working in cramped space where boom couldn't be raised above cab top required exceptional control to place gas main sections under the small cross pipes.

But the job was done . . . and done *profitably and easily* with a MICHIGAN crawler and a MICHIGAN truck crane by William W. Adams, Inc., general contractors of Tenafly, New Jersey. That's why George Adams says . . .

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Comments like these are typical from profit-wise contractors everywhere. Next time *you* need an excavator crane . . . investigate MICHIGAN and you'll agree it's *your best buy!* Write, wire or phone for full details.

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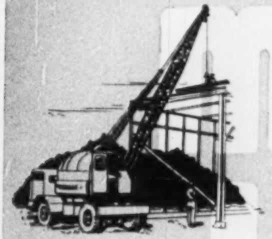
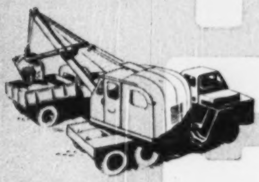
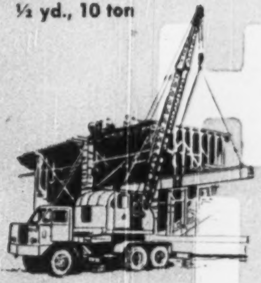


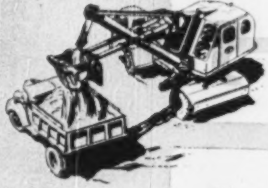
Model T6K
⅜ yd., 6 ton



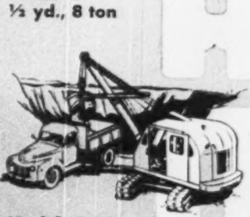
Model TMDT-16
½ yd., 10 ton



Model TLDT-20
12 ton



Series 8
½ yd., 8 ton



Model C-16
½ yd., 8 ton

How to better your score on the long holes

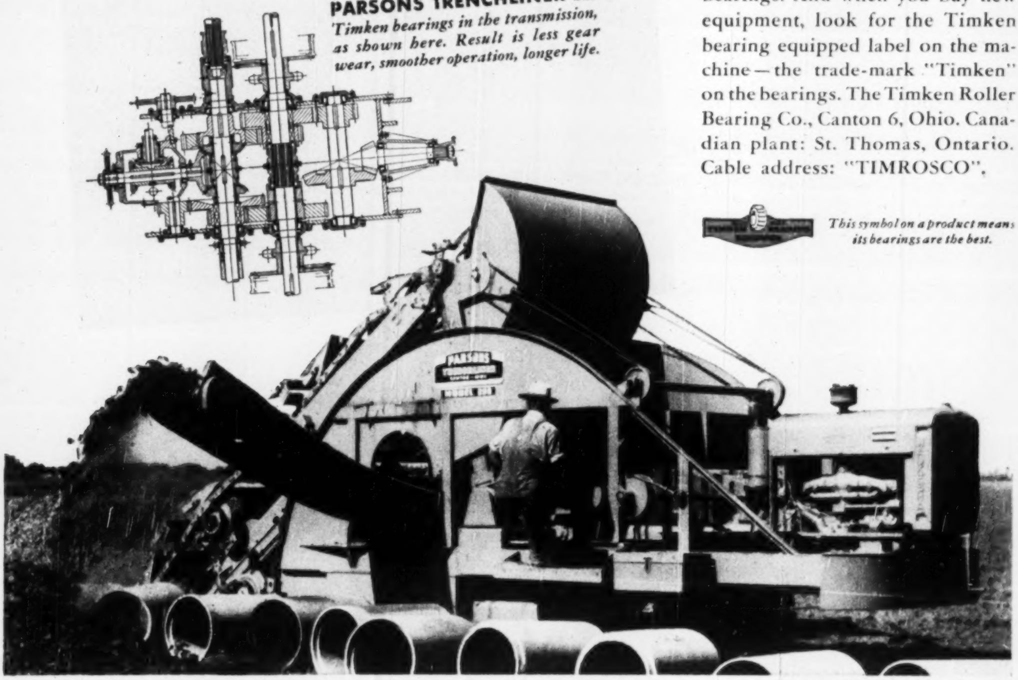
THE Parsons 250 Trenchliner shown here makes a trench as deep as twelve and a half feet, handles up to three and a half cubic yards a minute. It digs trenches for cross-country pipelines; water, sewer, and gas mains; road, airport, and railroad drainage; electrical conduit installations. To insure fast, efficient digging of these long holes, Parsons mounts vital parts of the Trenchliner on Timken® tapered roller bearings.

Due to the line contact between the rollers and races, Timken bearings have extra load-carrying capacity. Their tapered construction enables them to take any combination of radial and thrust loads. Gears and shafts are held in proper alignment.

Timken bearings are manufactured to extreme limits of precision and finished to incredible smoothness, resulting in practically friction-free operation. Under normal usage they last the life of the machine because they are (1) carefully engineered for the job, (2) made of Timken fine alloy steel, and (3) precision manufactured.

No other bearing gives you *all* the advantages you get with Timken tapered roller bearings. When you specify bearings, specify Timken bearings. And when you buy new equipment, look for the Timken bearing equipped label on the machine—the trade-mark "Timken" on the bearings. The Timken Roller Bearing Co., Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.



PARSONS TRENCHLINER *has Timken bearings in the transmission, as shown here. Result is less gear wear, smoother operation, longer life.*

WE MAKE OUR OWN STEEL

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The Timken Roller Bearing Company is the acknowledged leader in: 1. advanced design; 2. precision manufacturing; 3. rigid quality control; 4. special analysis steels.

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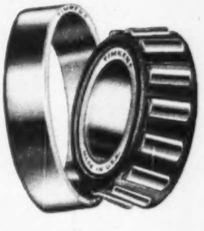
TAPERED ROLLER BEARINGS



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